

# SALVAGGIO, TEAL & ASSOCIATES

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INFORMATION SYSTEMS CONSULTING FOR THE PUBLIC SECTOR

April 4, 2003

Mr. Richard Rognehaugh  
Deputy Commissioner and Chief Information Officer  
State of Tennessee  
Office for Information Resources  
312 8th Avenue North  
Tennessee Tower, 16th Floor  
Nashville, Tennessee 37243

Dear Mr. Rognehaugh:

Salvaggio, Teal & Associates is please to submit our final report documenting the results of the ERP Automation Assessment Study. We are providing our report in hard-copy and in electronic format.

We enjoyed working with you and the many State managers and subject matter experts who contributed to the study, and we are grateful for all the hard work you and the others put into this effort.

We greatly appreciate having had the opportunity to assist the State with this important study and look forward to being of further assistance to the State in the future. Should you have any questions or comments regarding our report, please do not hesitate to contact me at 512-797-7338 or by email at [mitt@salvagg.com](mailto:mitt@salvagg.com).

Sincerely,

Mitt A. Salvaggio  
President

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## EXECUTIVE SUMMARY

An enterprise resource planning (ERP) system is a suite of fully integrated software applications that are used to perform the State's administrative business processes such as financial management, procurement, personnel, and payroll administration. What distinguishes ERP systems from "stand-alone" best-of-breed administrative software solutions is the integration that allows for more efficient processing and eliminates redundant data entry. A detailed definition of ERP systems is provided beginning on page 14 of the *Introduction* section of this report.

### BACKGROUND AND OBJECTIVES

The State of Tennessee (State) Department of Finance and Administration (F&A) initiated an ERP Automation Assessment Study (Study) in April 2002 to research the feasibility of implementing an ERP system to meet the State's financial management, procurement, human resources, payroll administration and other administrative business needs. The primary reasons the Study was initiated are:

- ◆ Numerous State systems are required to meet the State's administrative business needs. Currently, there are more than twenty (20) systems that support human resources and payroll administration, and more than fifty (50) systems that support financial management, procurement, and other administrative areas. Having such a fragmented technical environment has the following drawbacks:
  - Data is fragmented making it difficult to generate management information timely and accurately;
  - Systems are costly to maintain and operate (e.g., data must be reconciled among the various systems, numerous interfaces must be maintained, etc.); and
  - Systems are difficult to use – often State employees must work with several of these systems, and each system has its own unique "look and feel".
- ◆ The technology of the State's administrative systems is dated. Some of the systems are twenty (20) to thirty (30) years old, and as a result:
  - The State is unable to "plug-and-play" with new (and even not so new) technologies (e.g., Internet-based technologies, bar coding);
  - It is often difficult to modify the systems as the changes require "hard-coding" (i.e., changes must be made to the actual computer code instead of simply changing data table entries to make the changes as is the case in more modern systems);
  - The State is exposed to significant risk (e.g., some technologies are becoming obsolete and will eventually become difficult to replace, and it will become increasingly difficult to find people to maintain these systems);
  - The staff with skills that maintain these systems are rapidly approaching retirement; and

- The systems are difficult to use as they lack the modern, Windows-based, common user interfaces that system users are accustomed to using (e.g., email, office applications, Internet browsing).
- ◆ The current systems do not meet the State's business needs. A number of business needs are not being met by the current systems. Examples of these needs include performance-based budgeting, vendor self-service, and employee self-service. As a result of these unmet needs:
  - The State's business processes are less efficient and effective than they could be.
  - Agencies continue to spend significant amounts of money on systems with functionality that is contained in ERP systems – this money could be spent toward the implementation of a single, statewide ERP system.

Implementing a statewide ERP system could prove to be a viable approach to addressing the system problems described above. An ERP system is a suite of fully integrated software applications that are used to perform administrative business functions such as financial accounting, procurement, and personnel administration. In State of Tennessee terms, ERP is a software package that provides functionality similar to current State systems (e.g., STARS, TOPS, SEIS, TIS and other agency administrative systems) but all in one, fully integrated system.

World-class businesses have found that implementing an ERP system is a fundamental way to improve the efficiency and effectiveness of their business operations. Until recently, the government functionality of ERP systems has lagged behind private sector functionality, but ERP functionality for the public sector has matured considerably in recent years. States like Pennsylvania, Missouri, and Montana have employed ERP systems as a way to achieve more efficient government, streamline administrative business processes, and provide improved service to employees, vendors and other stakeholders via self-service functionality. In fact, more than twenty (20) states have implemented or are in some phase of implementing ERP software.

In April 2002, the Office for Information Resources (OIR) assembled an ERP Work Group consisting of key stakeholders and sponsors of a potential new ERP system to discuss the possibility of replacing core business systems within the State. Participants in the ERP Work Group include:

- ◆ Richard Rognehaugh – Chairperson – Department of Finance and Administration, Office for Information Resources
- ◆ Charles Bilbrey - Comptroller of the Treasury
- ◆ Bob Bumbalough - Department of Human Services
- ◆ Richard Chapman - Department of Finance and Administration, Division of Insurance
- ◆ Steve Curry – Office of the State Treasurer
- ◆ Jamie Etheridge - Department of Finance and Administration, Office for Information Resources

- ◆ Bill Ezell - Department of Finance and Administration, Office for Information Resources
- ◆ Ken Haynes - Department of Personnel
- ◆ Ed Hennessee - – Office of the State Treasurer
- ◆ Tom Hickerson - Department of Finance and Administration, Office for Information Resources
- ◆ Fred Hix - Department of Correction
- ◆ Nat Johnson - Department of Personnel
- ◆ Lou Kompare - Department of Finance and Administration, Office for Information Resources
- ◆ Sally Lewis - Department of Finance and Administration, Information System Management
- ◆ Vic Mangrum - Department of Finance and Administration, Office for Information Resources
- ◆ Newton Malloy - Office of the State Treasurer
- ◆ Rick Newton - Department of Finance and Administration, Division of Budget
- ◆ Mike Shinn - Department of Transportation
- ◆ Dale Sims - State Treasurer
- ◆ Ken Steverson - Department of Children's Services
- ◆ George Street - Department of General Services
- ◆ Jan Sylvis - Department of Finance and Administration, Division of Accounts
- ◆ Rose Wathen - Department of Finance and Administration, Office for Information Resources
- ◆ Gladys Wolfe - Department of Finance and Administration, Office for Information Resources

The Work Group sought a consulting firm with ERP experience to assist in conducting the Study. A competitive formal evaluation process that included five (5) vendors was initiated on June 10, 2002. The consulting firm of Salvaggio, Teal & Associates (STA) was engaged to assist in the study on August 1, 2002, and the study was completed in March 2003.

The best timing for an ERP implementation (assuming the State chooses to move forward with ERP) has not yet been determined. However, a key timing consideration is to attempt to ensure that the continuity of executive sponsorship from the Governor and top-level agency administrators is established and maintained. Consistent, effective executive sponsorship will be critical to the success of a statewide ERP implementation. Executive sponsorship is one of the primary drivers of organizational change; key

resources and timely decisions are more likely to be obtained when senior leadership demonstrates that it fully supports the project.

One factor that can adversely impact the level and continuity of executive sponsorship is a change in administration. A new Governor will have his/her own priorities, and these priorities may or may not include the implementation of a statewide ERP system. Additionally, many top-level agency administrators will change as the new Governor appoints new agency leadership, and some of the new administrators may not consider the implementation of an ERP system a business priority. It is critical that the implementation starts early in a Governor's period in office in order to minimize the risk of losing executive sponsorship as a result of a change of administration during the implementation (i.e., attempt to implement the ERP system under one administration).

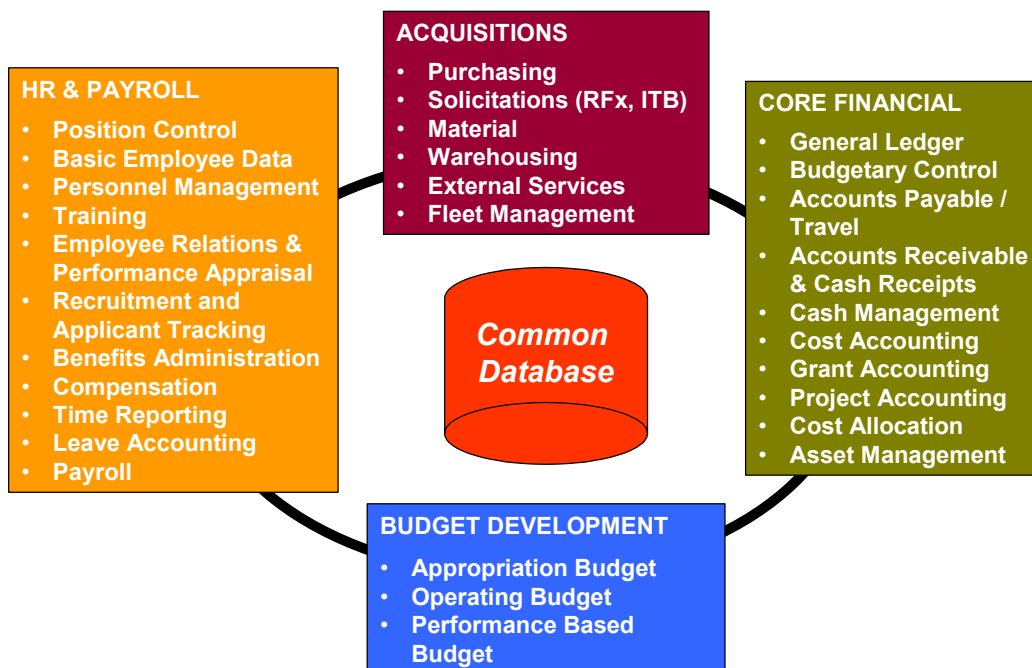
## SCOPE AND APPROACH

This section of the document describes the functional and organizational scope of the study, as well as provides an overview of the approach that was employed in performing the Study.

### Scope of the Study

The functionality provided by ERP systems is usually provided in functional modules. Additionally, certain features such as workflow, security, reporting, and the development toolset cross all functional modules. Illustrated below are key components of an ERP system:

#### ERP Modules Commonly Used in the Public Sector



All of the functional areas depicted in the diagram above are modules the State is most interested in acquiring, and are the areas included in the scope of this Study. A detailed discussion of the functional scope is provided in the next section titled “Introduction”.

The organizational scope of the Study includes all State agencies, excluding institutions of higher education.

### **Approach**

The ERP Work Group developed a series of activities that needed to be accomplished in order to obtain the information and financial data required for State leadership to properly assess whether it is in the State’s best interest at this time to initiate the implementation of an ERP system, and these activities were performed as part of this Study. The activities included the following:

- ◆ Documented the major “As Is” business processes (the way we do business today);
- ◆ Prepared an interface model that identifies interfacing system requirements between the proposed new ERP system (as envisioned) and statewide legacy business systems that will continue to operate and must be interfaced to the new system;
- ◆ Identified laws, rules, regulations and policies that may require changes in order to effectively implement a new ERP system;
- ◆ Developed “To Be” (desired future state) functional and technical requirements for a new ERP system based on best business practices and prioritized these requirements, based on criticality to the business needs of the State;
- ◆ Performed a functionality comparison (fit/gap) analysis to determine how well a new ERP system could meet the State’s administrative business needs;
- ◆ Produced a cost/benefit analysis;
- ◆ Recommended a strategy for acquiring the new ERP software along with associated consulting services required to implement the software; and
- ◆ Recommended a deployment strategy for implementing the ERP functionality.

The Study was conducted over an eight-month period beginning in August 2002 and involved a significant number of individuals throughout the State:

- ◆ More than 150 meetings were conducted, involving approximately 750 attendees (265 individuals) from a wide cross section of state government (54 agencies).
- ◆ Developed more than 2,500 “best business practice” system requirements in twenty (20) functional areas with subject matter experts from key State agencies. Comparative best practices were presented from existing ERP vendors, as well as from actual state government case studies, and discussed in terms of their appropriateness in Tennessee. These requirements were then distributed to all State agencies (other than institutions of higher education) for review and comment.

Information was also collected from sixteen (16) other states that have implemented, or are in the process of implementing, ERP systems, and from the University of Tennessee, which has recently implemented an ERP system.

## KEY FINDINGS

The key findings of the study are described below:

♦ ***ERP software functionality is a good fit for meeting the State's business requirements***

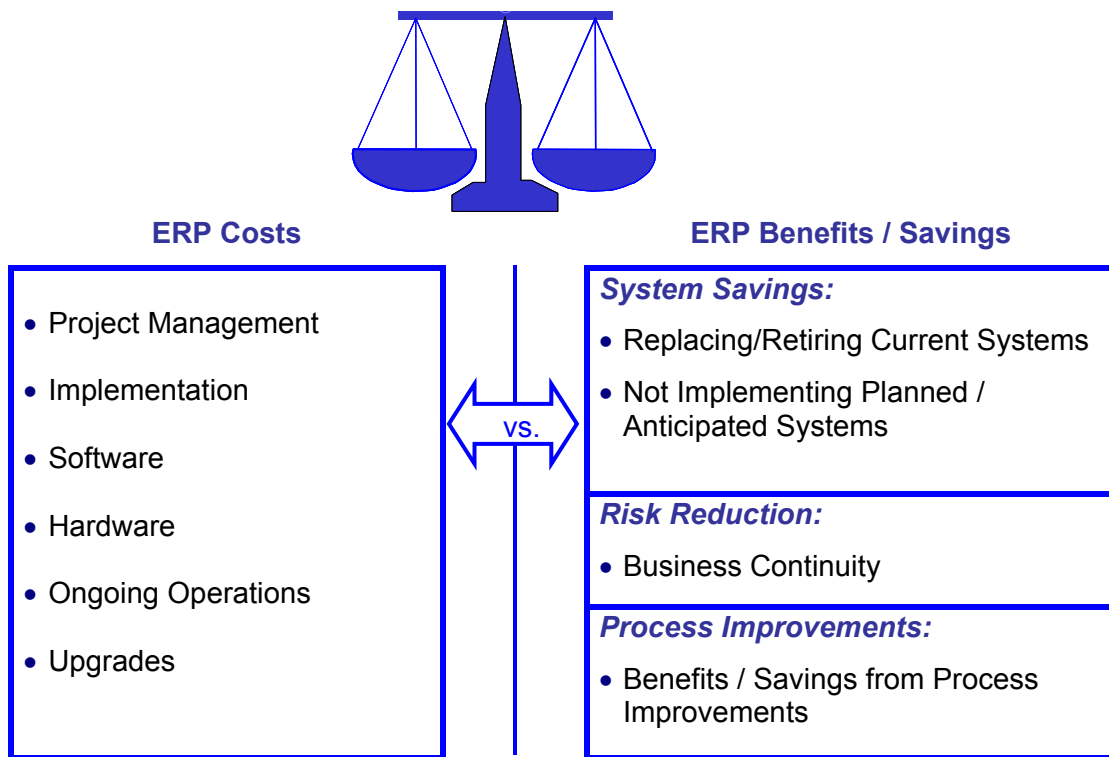
A major task in the Study was to assess ERP software's ability to meet the State's business requirements. In order to perform this assessment, the State's business requirements were documented and issued as part of a Request for Information (RFI). ERP vendors were asked to address their ability to meet each requirement. It should be noted that the RFI included fleet management requirements and Department of Transportation (TDOT) specific project accounting and materials management requirements that are not traditionally found in baseline ERP software products.

We received responses from five (5) major ERP vendors. Our findings are summarized as follows:

- On average, the ERP products met 78% of the State's requirements with standard functionality, with the highest level of "fit" being 95% and the lowest being 58%.
- Excluding the Vehicle Fleet Management requirements, TDOT-specific Project Accounting requirements, and Materials Management requirements from the analysis, on average, the ERP products met 92% of the State's requirements with standard functionality, with the highest level of "fit" being 96% and the lowest being 63%.

♦ ***Implementing an ERP system would require a significant investment, but would yield significant quantifiable benefits / savings***

As part of this Study, a cost/benefit analysis (CBA) was performed. The CBA evaluated the estimated cost of implementing and maintaining a statewide ERP system vs. the potential benefits/savings from such an implementation, including: (1) retiring current systems and avoiding the implementation of planned/anticipated systems, (2) reducing business risk, and (3) realizing benefits/savings from process improvements that would result from the ERP implementation.



The CBA was conducted in light of the State's existing 10-year lifecycle IT analysis practice (plus a "Year 0" for efforts leading up to contract award). So, for this 11-year planning period, the CBA was based on the following assumptions regarding the timing of the initiative:

- **Project Preparation and ERP Acquisition**  
Prior to the actual ERP implementation effort (Years 1 through 5), the CBA schedule contains a Year 0 (assumed to be fiscal year ending in 2004). During this time period, it is assumed that the State will move forward with procurement activities (e.g., develop and issue an RFP for ERP software and associated implementation services, create a formal vendor evaluation process, develop vendor demonstration scripts, etc.), and will perform certain activities that will help the State prepare for implementing an ERP system.
- **ERP Implementation**  
It is assumed that the ERP system will be implemented over a five-year period in three phases:
  - **Phase 1**  
During this phase, Human Resources, Payroll Administration, and Benefits Administration functionality will be implemented at all State agencies over a period of 24 months (Years 1 and 2). Administration of insurance benefits will

also be implemented during this phase for Higher Education and the Board of Regents, Local Education, and Local Government.

- **Phase 2**

Financial Management, Budget Development, and Inventory functionality will be implemented for all agencies except TDOT after Phase 1 is completed, over a period of 18 months (Year 3 through mid-Year 4). Procurement functionality, including eProcurement, will also be implemented for all agencies during this phase, including TDOT (assuming TDOT's functional needs can be met by the ERP system).

- **Phase 3**

All remaining functionality (Financial Management, Budget Development, and Inventory) will be implemented for TDOT (assuming TDOT's functional needs can be met by the ERP system) over a period of 18 months (mid-Year 4 through Year 5). Fleet Management functionality will also be implemented for TDOT and the Department of Safety during this phase.

- **System Upgrade**

It is assumed that an ERP software upgrade will be performed in Year 6 of the planning period (in the 7<sup>th</sup> year of the initiative taking into account Year 0).

- **Ongoing Operations**

Ongoing operational activities will begin when Phase 1 goes live (at the end of Year 2) and continue through the remainder of the CBA planning period.

The schedule below presents a summary of estimated cost of implementing an ERP system applied against the estimated potential benefits/savings that could be realized from such an implementation.

Summary of Net Benefits/Savings from Implementing ERP  
(\$ millions)

Phases ➡	Acquire.	HR/Payroll		Fin/Purch.	TDOT		Upgrade						Total
Cost Category	Years												
	0	1	2	3	4	5	6	7	8	9	10		
ERP Cost	\$ 1.9	\$ 19.5	\$ 17.9	\$ 31.2	\$ 27.1	\$ 19.5	\$ 21.8	\$ 7.2	\$ 7.2	\$ 7.2	\$ 7.2	\$167.8	
ERP Benefits/Savings													
System Savings	1.2	1.2	2.8	5.3	4.7	19.2	19.4	19.6	20.3	20.2	20.2	134.1	
Process Improvements	-	-	-	1.4	3.4	5.5	7.0	8.5	8.7	8.7	8.7	51.8	
Total Savings	1.2	1.2	2.8	6.7	8.1	24.7	26.4	28.1	29.0	28.9	28.9	185.9	
Net Savings (savings less ERP Cost)	\$ (0.7)	\$ (18.2)	\$ (15.0)	\$ (24.5)	\$ (19.0)	\$ 5.2	\$ 4.5	\$ 20.9	\$ 21.7	\$ 21.6	\$ 21.6	\$ 18.1	
Cumulative Net Savings	(0.7)	(19.0)	(34.0)	(58.5)	(77.5)	(72.3)	(67.8)	(46.9)	(25.2)	(3.5)	18.1		

We believe there is more savings to be found, but due to time constraints we did not have time to “dig deeper” and find these dollars.

It is estimated that over the 11-year (Years 0 – 10) CBA planning period, it would cost the State approximately \$168 million to implement and operate an ERP system, but that the State would realize total benefits/savings of approximately \$186 million.

It is important to note that the estimated implementation costs presented above are very conservative (high-end) and are based on an extended five-year implementation period described above. STA believes that the ERP vendors may recommend a more compressed implementation timeline be used, which may result in significantly less implementation costs. However, the dimensions of time and cost must be balanced with the increased risk associated with a more aggressive implementation timeframe.

Additional information regarding the CBA estimates is included in the “COST BENEFIT ANALYSIS” section and Appendix G of this report.

◆ ***On balance, there are a number of reasons the State should consider implementing an ERP system***

There are numerous reasons for considering a statewide implementation of an ERP system. These reasons include:

- Increased Productivity / Cost Savings
  - Increased productivity due to adoption of best business practices commonly found in ERP software solutions.
  - Provides individual agencies with a viable alternative to purchasing a new accounting system or upgrading their existing system to meet internal accounting and reporting needs. Various State agencies are actually acquiring components of non-integrated ERP today, such as Oracle financials for TennCare and DCS.
  - Elimination of paper documents or reduction of paper to the extent allowed by law.
  - More efficient processing and control of documents through automated workflow, review and approvals, and inquiries on document status and possible “bottlenecks” in approval process.
  - Elimination of duplicate data entry as pertinent data is entered once in the system and then carried throughout the system.
  - Reduction of data integrity concerns and the effort required to reconcile duplicate data in multiple databases.
  - Improvement in the timeliness and reliability of employee data through employee self-service, while saving state dollars as documented below.
  - Correction of functional deficiencies associated with existing administrative systems.
- Technology Improvements
  - The State’s existing Human Resources and Payroll systems are based on prior generation technology and are difficult to maintain. Compensation and personnel policy changes often require hard-coded system changes (i.e., specifically written into the software rather than controlled by data-table entries that can easily be changed), that are difficult and time-consuming to make. Due to the age of these

systems, few of the State's personnel have a thorough knowledge of the system, leaving the State vulnerable to exiting employees. Maintenance of the technology associated with this system is likely to be discontinued in the near future.

- Supports a graphical user interface, which provides user-friendly features such as pull-down menus, point and click operation, pop-up windows, scroll bars, radio buttons, and online help, to assist in the user's learning and ongoing use of the system.
- More efficient and accurate research capabilities, through enhanced ad hoc reporting and inquiry functionality associated with new technologies.
- System-wide integration – the integration of the various ERP modules has been built by, and will be maintained by, the software vendor
- ERP's web-based, open architecture will enable the State to “plug and play” with new technologies (e.g., eBusiness). This will also decrease the State's exposure to the risks of the current aging systems (i.e., obsolescence and scarcity of resources to support the systems).
- Use of a single development toolset to support software configuration, customization, and ongoing administration of the system.
- Use of relational database technology.
- Application modularity allows the State to selectively implement ERP functionality based on priorities, funding availability, and staff availability to implement and support the system.
- Comprehensive drill-down capabilities and audit trail.
- Desktop software integration allows for extracting data from the ERP software into common desktop applications such as the Microsoft Office suite for data manipulation and analysis.

♦ ***An ERP implementation would not be without risk***

The benefits of implementing ERP systems can be significant. These systems can improve the decision-making capabilities of governments and improve government efficiency, but there are inherent risks as well. Major risks that must be properly managed include:

- Software and implementation services are expensive and the State's limited dollars must be prudently managed.
- Project scope must be defined and tightly controlled to mitigate “scope creep”.
- Turf battles over system ownership may arise.
- At times, prior government ERP implementation projects have failed to hold the prime contractor accountable for project success.
- Governments have shown an inability to resolve issues and make decisions in a timely manner.

- ERP projects have experienced a lack of adequate knowledge transfer and continued reliance on consultants to provide ongoing support for the system.
- Governments often struggle to provide effective project management.
- It is sometimes difficult to field a team of implementation consultants that have a thorough knowledge of the ERP software to be implemented and/or knowledge of how the public sector operates.
- Contracts for ERP implementations typically require that the government commit specific levels and types of resources to the project. Though commitments are made, State resources are not available when needed, and/or do not have the types of skills required for the role they have been placed in.
- It is very common for organizations to underestimate the level of change management required as part of an ERP implementation.
- Inadequate training of end users is always a potential problem when implementing a new ERP system.
- A perceived or real lack of executive support for the Project will almost certainly ensure its failure.
- The ERP software, as configured, may not meet the State's civil service requirements and other business needs. At the time of this report, it appears that most states that have implemented ERP systems have continued to utilize "stand-alone" systems to address their civil service hiring requirements.
- Unrealistic timeframes and deployment strategies have led to cost overruns and scaled-back functionality.
- In early ERP projects implemented for government, a heavy emphasis was placed on modifying the software to better meet the government's system needs. Extensive modifications increased project risks, led to increased project cost and time overruns, and often impaired the installation of future product releases.
- Prior public sector ERP projects have often failed to deliver on system capabilities on which the business case justification and return on investment were established.

## INTRODUCTION

The State of Tennessee (State) Department of Finance and Administration (F&A) initiated an ERP Automation Assessment Study in August 2002 to research the feasibility of implementing a new enterprise resource planning (ERP) system to meet the State's financial management, procurement, human resources, payroll administration and other administrative business needs. The State established a formal ERP Work Group with representatives of the various administrative stakeholders and engaged the consulting firm of Salvaggio, Teal & Associates (STA) to assist in the study. This report documents the work and results of the study.

### BACKGROUND

As part of the State's information systems planning process, each agency presents a technology plan for the next three fiscal years. Agencies describe their strategic business plans and how technology will be used to implement solutions in support of their business plans and to address problems. During the last several planning cycles, a number of central agencies described and presented major systems replacements. What made these replacements unique was that the systems under discussion impacted every agency and commission within state government. The core business systems that support the State's infrastructure were aging and the agencies that are responsible for these business areas were planning for system replacement. Each of these core business systems is interrelated to many business processes. If one system is changed or replaced, there is a major impact on other business processes and the supporting systems. For example:

- ◆ If the current payroll system were replaced, the existing accounting and human resources systems would be impacted as well as automated interfaces to/from each system.
- ◆ If the current human resources system were replaced, the existing accounting and payroll systems would be impacted as well as automated interfaces to/from each system.
- ◆ If the current accounting system was replaced, the existing purchasing, payroll, benefits, travel, labor distribution, budget, treasury, and revenue systems would be impacted, as well as automated interfaces to/from each system.
- ◆ These core business systems touch all departments from both a systems perspective and business process perspective. A new accounting system would also impact automated interfaces to/from other user agency-specific administrative systems.

The agencies responsible for the core statewide business functions form a close working relationship in order to provide the necessary services to support State administrative operations. Payroll, under F&A, and personnel functions under the Department of Personnel, have a partnership dedicated to providing cost-effective and accurate payroll and human resources functions. Purchasing, under the Department of General Services, provides central purchasing services for all of state government. Purchasing is closely linked to the

accounting processes administered through the Division of Accounts within F&A. These are only a few of the examples of the business relationships that are important to the effective management of the core statewide business functions.

As the business of the State guides the need for automation, the business partnerships must also be reflected in the choice of automation solutions. In the case of the core business areas, one central agency should not act independently in the evaluation, acquisition, and implementation of an administrative software system since the other central agencies will be impacted significantly. These central agencies have found that a common strategic direction must be created that reflects the need to form an integrated systems solution for those business areas with strong co-dependencies.

In April 2002, a working group was formed to discuss the possibilities of replacing core statewide business systems within the State of Tennessee. This group is composed of the major stakeholders of the State's central business functions representing the following entities:

- ◆ Department of Personnel
- ◆ F&A, Division of Accounts
- ◆ F&A, Office of Budget and Finance
- ◆ F&A, Insurance Administration
- ◆ Comptroller of the Treasury
- ◆ Department of the Treasury
- ◆ Department of General Services
- ◆ F&A, Office for Information Resources
- ◆ F&A, Division of Administration, Information Systems Management

ERP software was seen as a possible cost-effective solution for replacing the State's aging legacy administrative systems. ERP offered an approach for an enterprise-wide solution that would be fully integrated, utilize best business practices, and offer a much-needed enhancement to the level of services offered by central business areas. Originally, discussions were limited to payroll and human resources areas, and these areas remain the most critical of the aging legacy systems. But as the business partnerships were discussed, the scope was expanded to include a wider evaluation of an enterprise-wide alternative.

The business partnership was formalized and became known as the ERP Work Group.

## **PROJECT SCOPE AND APPROACH**

The ERP Automation Assessment Study was initiated in August 2002. The purpose of the ERP Automation Assessment Study was to perform a series of tasks that will provide the ERP Work Group and the State's leadership with the data and other information necessary for determining whether implementing a statewide ERP system is viable for the State of Tennessee. The deliverables that were produced during the project include the following:

- ◆ Documentation of the major “As Is” business processes. The documentation includes an overview of the process, a high-level flowchart documenting the process, potential process improvement opportunities, and potential changes that will be required to achieve the improvement opportunities;
- ◆ Development of an interface model that identifies interface requirements between the potential ERP system (as envisioned) and statewide legacy business systems that will continue to operate and must be interfaced to the new system;
- ◆ Identification of laws, regulations and policies that may require changes in order to effectively implement an ERP system;
- ◆ Development of “To Be” functional and technical system requirements for an ERP system;
- ◆ Development and issuance of a Request for Information (RFI) that was used to determine how well potential ERP vendors could meet the State’s functional and technical system requirements and the estimated costs of implementing a new statewide ERP system;
- ◆ Development of a vendor comparison analysis, including an evaluation of each vendor’s response to the RFI against the State’s system requirements;
- ◆ Development of the business case and cost/benefit analysis that supports an ERP system;
- ◆ Recommendation of a strategy for acquiring the ERP software along with associated consulting services required to implement the software; and
- ◆ Recommendation of a deployment strategy for the ERP modules within the scope of the project.

### **DEFINITION OF AN ERP SYSTEM**

An ERP system is a suite of fully integrated software applications that are used to perform administrative business functions such as financial accounting, procurement, and personnel administration. What distinguishes ERP systems from “stand-alone” best-of-breed administrative software solutions is the integration that allows for more efficient processing and eliminates redundant data entry.

The functionality provided by ERP systems is usually provided in major groupings or modules. Modules include: Human Resources / Personnel / Payroll, Core Financials, etc. Additionally, certain features such as automated workflow, security, reporting, and the development toolset cross all functional modules. Illustrated below is a depiction of key components within an ERP system.

## ERP FUNCTIONALITY COMPONENTS

Accts. Payable	Accts. Receivable	Asset Mgmt.	Grant & Project Acct.	Purchas- ing	Budget Dev.	Time Report- ing	Human Resources	Payroll	Fleet Mgmt.
General Ledger (includes Budgetary Control and Chart of Accounts)									
Security									
Workflow									
Reporting									
Development Toolset									

Functional modules of an ERP system that the State is most interested in acquiring were the scope of this study, including:

### *Financial Management*

#### **General Ledger**

The General Ledger is an integrated central repository of statewide financial data. Numerous types of financial transactions are recorded in the General Ledger, both directly and through data received from other ERP modules as well from interfacing external systems. The General Ledger is the key module used in financial reporting. The chart of accounts is established and maintained in the General Ledger. Additionally, budgetary control is established and enforced through this module. Traditionally, this module is implemented first as most other modules require some interaction with the General Ledger.

Additionally, the General Ledger provides:

- ◆ Basic fund accounting;
- ◆ Corrective and/or adjusting journal entries;
- ◆ Interfund/interagency transaction processing;
- ◆ Month-end and year-end closing;
- ◆ State and federal reporting;
- ◆ Budget maintenance and monitoring;
- ◆ Budget adjustments;
- ◆ Governmental Accounting Standards Board (GASB) Statement No. 34 compliance;
- ◆ Cost allocation; and
- ◆ Labor distribution.

### ***Accounts Payable***

The Accounts Payable module addresses the various means by which the State pays for goods and services. The module is used to record liabilities and payments. The automated matching process takes place in this module. Before a payment is processed, a successful “match” must be completed and sufficient budget must exist to cover the payment. The Accounts Payable module shares the vendor file with the Purchasing module. Additional functionality provided by this module includes:

- ◆ Invoice processing;
- ◆ Automated matching process (purchase order, receiving report, invoice);
- ◆ Payment processing (discounts, holds, warrant/check printing, direct deposit, and handling);
- ◆ Automated bank reconciliation;
- ◆ Electronic funds transfer;
- ◆ Form 1099 processing; and
- ◆ Employee reimbursement.

### ***Accounts Receivable and Billing***

The Accounts Receivable module is used to record receivables and payments received against specific customer accounts. Billing functionality supports the processing of billings and generation of new receivables. Most systems also provide functionality to support the collection process (e.g., dunning notices).

### ***Cash Receipting***

The Cash Receipting module supports cash drawer and lockbox processing. This module is typically designed to work with industry-standard third party cash register products.

### ***Asset Management***

The Asset Management module is used to capture and maintain information associated with the government's leased, capitalized, and non-capitalized assets. Information maintained in this module includes acquisition cost, asset type, location, asset description, model number, serial number, insurance information, and replacement cost. Depreciation schedules are used to maintain current asset value.

Specific areas of functionality include:

- ◆ Asset creation,
- ◆ Asset maintenance (including transfers),
- ◆ Asset depreciation,
- ◆ Asset disposal, and
- ◆ Asset retirement.

### ***Grant Accounting / Management***

Basic Grant Accounting modules support the establishment of a grant budget, and the recording of expenditure activity against the grant budget and pre-defined grant budget categories. These modules also allow for the reporting of grant activity by period or over the life of the grant award.

More sophisticated Grants Management modules are just starting to make their way into the governmental ERP marketplace. These modules allow for the recording of detailed information about each grant, grant application activity, as well as grant drawdown activity.

### ***Project Accounting***

Project Accounting modules address the recording, tracking, and reporting of financial data for projects and contracts. These modules typically address the key processes for operating and capital projects, including budget development, project development, execution, and the project close process.

Project Accounting modules typically support the establishment of a project budget (which is typically linked to a funding source), and the recording of expenditure activity against the project budget (by pre-defined project task or activity). These modules also allow for the reporting of project activity by period or over the life of the project.

### ***Purchasing / eProcurement***

The Purchasing module provides traditional procurement functions such as requisitioning, solicitations, purchase order processing, contract management, and goods and/or services receipt. Vendor and commodity maintenance is also addressed in this module.

New state-of-the-art eProcurement technology supports web-based vendor registration, on-line catalog procurements, web-based solicitations, and reverse auctions.

### ***Inventory***

The Inventory module supports the establishment, storage, tracking, and disposal of inventory items, automated inventory replenishment at pre-defined reorder points, and recording of all inventory activity. The Inventory module is typically integrated with the Purchasing and Accounts Payable modules, and checks the General Ledger for funds availability when replenishing goods in inventory.

### ***Budget Development***

The Budget Development module enables the development of the State's budget at the agency and the statewide (appropriation) levels. Budget Development integrates with both human resources to facilitate salary projections and general ledger to upload budgetary data for budgetary control. This module is intended to support the analysis of historical expenditure and budgetary data, allow "what if" analyses, salary and position budgeting, salary projections, and other types of forecasting.

Budget development functionality required by sophisticated governments has been the “weak link” in ERP systems to this point, so many governments address their budget preparation needs through electronic spreadsheets or third party budget development applications.

## ***Human Resources***

### ***Personnel Administration***

The Personnel Administration module provides for the maintenance of personnel information pertaining to each employee from application through retirement. This information includes the following:

- ◆ Basic demographic and address information,
- ◆ Emergency contact data,
- ◆ Organizational and funding source data,
- ◆ Employment history, and
- ◆ Personnel actions (demotion, promotion, salary increase, leave without pay).

### ***Position Control***

The Position Control module supports the maintenance of all budgeted and authorized positions. More specifically, position control allows users to perform the following tasks:

- ◆ Provides edits to ensure that no personnel action can take place without an available qualified and active position,
- ◆ Tracks and reports budgeted, filled, frozen and vacant positions,
- ◆ Links positions to a funding source, and
- ◆ Links positions to required skills, certifications, etc.

### ***Compensation***

The Compensation module enforces the administration of the State's rules for calculating pay. In addition, this module includes specific functions as follows:

- ◆ Maintains effective salary dates,
- ◆ Calculates future pay increases,
- ◆ Calculates additional pay based on flexible, user defined criteria,
- ◆ Calculates step, increment, and percentage pay increases for all or a group of employees,
- ◆ Projects costs for future fiscal years, and
- ◆ Provides analysis of compensation by Chart of Account element.

### ***Payroll***

The Payroll Module provides for the calculation, production, and distribution of payroll warrants and the processing of direct deposits. In addition, this module provides the following additional functionality:

- ◆ Maintains salary, deduction, and pay history and totals by employee and fund,
- ◆ Complies with State and Federal payroll tax withholding and reporting requirements,
- ◆ Supports retroactive and manual payments, and various pay cycle frequencies,
- ◆ Calculates benefit deductions based on rules specified in Benefit Administration module, and
- ◆ Calculates pay based on user-defined criteria (pay status, overtime rules, etc.).

Payroll modules in some ERP systems now provide employee travel reimbursement processing as well.

### ***Time Reporting and Employee Leave Accounting***

Time Reporting addresses the administration of the State's rules for capturing and calculating time. This module includes functions to:

- ◆ Supports positive and negative (exception) time entry,
- ◆ Provides on-line time entry and the charging of time to pre-defined Chart of Accounts elements,
- ◆ Calculates overtime hours and eligibility,
- ◆ Supports flexible definition of shift and work schedules, and
- ◆ Provides flexible workflow for review and approval of automated timesheets.

Leave Accounting addresses the administration of the State's rules for granting and using the various types of employee leave. In addition, this module provides the following features to:

- ◆ Calculates leave eligibility and leave availability,
- ◆ Allows employees to request leave on-line with automatic routing for approval,
- ◆ Notifies employees of leave that will be lost or automatically paid,
- ◆ Integrates leave types with Benefits Administration and Payroll, and
- ◆ Tracks leave taken, leave lost, and leave payments by leave type and reason.

### ***Benefits Administration***

The Benefit Administration module supports the comprehensive administration of multiple employee benefit, retirement and insurance plans. In addition, this module addresses the ability to:

- ◆ Maintains multiple eligibility rules,
- ◆ Maintains eligibility dates for different plans based on different rules,
- ◆ Tracks eligibility and enrollment of dependents,
- ◆ Maintains beneficiary information,
- ◆ Calculates employer and employee costs,
- ◆ Provides on-line (Web based or kiosks) and telephone benefit enrollment,
- ◆ Interfaces with benefit providers and third party administrators,

- ◆ Provides functionality to ensure compliance with COBRA requirements, and
- ◆ Tracks information related to HIPAA requirements.

### ***Applicant Services***

This module provides functionality to support the application process associated with a new job posting. Additionally, this module includes the capability to:

- ◆ Manages recruiting of both internal and external candidates,
- ◆ Manages testing requirements and results,
- ◆ Supports the submittal of applications and resumes through the web, and
- ◆ Supports compliance with civil service requirements.

### ***Training and Employee Development***

Training and Employee Development addresses the management of employee training and skills. Additionally, this module includes the capability to:

- ◆ Provides standard career development curriculum based on position, skill category, and other criteria,
- ◆ Allows employees to request training on-line and route request for appropriate approvals,
- ◆ Records training session attendance, grades, costs, certifications, etc.,
- ◆ Tracks classes and courses needed for career / job progression planning, and
- ◆ Tracks training class prerequisites.

### ***Employee Self Service***

Employee self-service allows State employees to perform common functions previously performed by human resources and payroll staff through a web browser or kiosk after entering their authorized user ID number and password. Some functions typically accessed through the web by State employees include:

- ◆ Viewing pay stub and withholding information,
- ◆ Changing basic employee information (e.g. address change),
- ◆ Changing benefit options,
- ◆ Checking leave balances and requesting time off,
- ◆ Checking the status of the travel reimbursements, and
- ◆ Registering to attend a training course.

### ***Other***

### ***Fleet Management***

Fleet management functionality has just recently become an offering of ERP vendors. Traditionally, this functionality has been provided by specialized “stand alone” software

applications. Fleet Management functionality includes asset identification, parts inventory maintenance and processing, and work order processing. More advanced applications also provide fuel supply management, driver licensing, accident tracking, and risk management functionality.

## ***System-Wide***

### ***Security***

Security is used to regulate who has access to what information. ERP systems typically offer a comprehensive security function that provides for:

- ◆ User log-in
- ◆ Row level (record) security
- ◆ Data field level security
- ◆ Restricted access to specific screens or processes
- ◆ Object security
- ◆ User group security

### ***Workflow***

Workflow allows for the establishment of business rules, roles, and routings that are used to route electronic documents (e.g., purchase requisition, timesheet) to proper supervisors and management for approval. It should be noted that workflow functionality is being used in a very limited manner in the public sector because it is typically complicated and expensive to configure. Governments most often use workflow in conjunction with procurement processes. Workflow facilitates an organization's transition to a "paperless" environment. To work properly, Workflow typically requires extensive configuration and a degree of standardization of approval processes across the enterprise. For this reason, it is best to limit the number of workflows to be implemented.

### ***Reporting***

ERP systems typically provide a suite of reporting tools that are used to develop ad hoc reports and on-line queries.

### ***Development Toolset***

Each ERP vendor provides a suite of tools that are used to configure, customize, troubleshoot, and maintain the application software. The toolset is usually proprietary to each specific vendor.

## **WHY SHOULD THE STATE IMPLEMENT AN ERP SYSTEM?**

There are numerous reasons why the State should consider implementing an ERP system. The major drivers toward ERP can be grouped into 3 categories: (1) legacy system deficiencies, (2) technology enablers, and (3) the results of a cost-benefit analysis (CBA). The CBA is discussed in Section VIII: Cost/Benefit Analysis of this report. Legacy system deficiencies and technology enablers are discussed below.

### **Legacy System Deficiencies**

Deficiencies associated with the existing legacy statewide administrative systems include:

- ◆ Limitations on capturing new data and providing new functionality without modifications.
- ◆ Inefficiencies and staffing costs associated with maintaining multiple stand-alone systems at the statewide level as well as additional “shadow” systems in some of the user agencies to provide functionality not met by the statewide systems (e.g., Department of Children’s Services, TennCare).
- ◆ Limited accessibility to information as reporting is limited to a set of standard reports and queries or a request for a new report. A major benefit of ERP systems is to provide properly trained end users with access to the data needed for timely analysis and decision-making.
- ◆ Data is maintained in multiple “stand-alone” systems and is not updated across systems in a “real-time” mode. Data maintained in independent databases or shadow systems can produce conflicting information.

### **Technology Enablers**

The most compelling reasons for implementing an ERP system lie within the technology enablers that support the system. Typical technology enablers found in ERP systems include:

#### ***Integration with a Common Database***

The most distinguishing factor of an ERP system is its integration across all system modules vs. the current environment that utilizes separate “stand-alone” systems, some of which have automated interfaces between them. This integration is supported by a single database across all functions (or at least a single database for HR/payroll functions and another for financial management/procurement functions). In this way, data elements (e.g., account codes) are not duplicated when used for more than one purpose. With no duplication, every function has access to the most recent information; once any change is made, it is immediately available to all functional modules.

#### ***Real-Time Processing***

Unlike the current systems that often have delays from the time an action is recorded by the user until that information is available to others due to batch or nightly updates, ERP systems use real-time processing, so processing results are immediately available to all other modules. Reports are generated using up-to-date information.

### ***Increased Functionality / Best Business Practices***

Today's ERP systems provide a considerable amount of functionality to meet governmental financial management, procurement, human resources/payroll, and other administrative business needs. The application modules that often comprise ERP systems have typically been designed in accordance with industry-standard best business practices.

While best business practices have not been defined by any governing body or research firm for the private or public sector, such practices have evolved over the years with each new software release and have been validated with each ERP implementation. Best business practices, together with the flexibility provided by technology enablers inherent in ERP software today, allow governments to conduct their administrative business processes in a more efficient and timely manner. Best business practices promote standardization of business processes across government, and it is critical that the government embrace these "best practices" in order to implement the ERP software with minimal customization. Some simple examples of best practices found in ERP systems include:

- ◆ Asset Management module "sweeping" the Accounts Payable module for potential capital assets based on specified parameters (selected object codes and threshold amounts) to reduce the possibility of capital assets going unrecorded;
- ◆ Electronic three-way match of invoice, purchase order, and receiving report reduces the use of paper documents and processing time, and allows staff to focus their efforts on exception resolution;
- ◆ Distribution of the automated requisitioning function eliminates the paper requisition document and workflow ensures compliance with pre-defined business rules and approval paths;
- ◆ On-line catalog maintenance and access for purchasers within the State ensure the use of approved suppliers and the latest pricing for goods; and
- ◆ Vendor access to payment information reduces staffing required to answer vendor inquiries.

### ***Web-Based / Open Architecture***

Today's leading ERP solutions are designed to be accessed through the use of an industry-standard web browser. Vendor products are transitioning to a "pure web-based" architecture whereby no code resides on the client other than the web browser. Web-based ERP solutions result in easier deployment and lower costs of IT infrastructure, network administration, and information access. They also give access to the ERP system at anytime as long as they have access to a web browser.

The leading ERP systems comply with open architecture standards as well. Open architecture provides a means whereby the ERP system can be linked to specific "best-of-breed" software if the need arises (e.g., possibly to meet fleet management requirements). Open architecture also provides the ability to interface the ERP system to common desktop "office suite" applications (see *Desktop Software Integration* below).

### ***Scalability***

Allows the State to size its system components to meet its ever-changing business needs. Increased capacity can be added, upgraded or removed as computing needs change, without substantial changes to the application. Scalability considerations include increasing memory, adding additional processors, and installing additional disk storage.

### ***Portability***

Provides flexibility for application software systems to run on multiple hardware platforms or provides built-in capabilities for switching between platforms without requiring re-installation or additional customization.

### ***Graphical User Interface***

ERP systems utilize a graphical user interface (GUI) that provides user-friendly features similar to other office functions on the user's desktop, such as intuitive icons, pull-down menus, point-and-click navigation, pop-up windows, scroll bars, radio buttons, the use of color for clarity and emphasis, and tool bars to assist in the user's learning and ongoing use of the System. They also provide on-line help menus and on-line documentation, as well as screens that can be customizable to user roles, to enhance the end user experience. The same interface and commands are used for all functions, thereby facilitating training for users that access multiple functions and functional areas.

### ***Efficient Modification Where Necessary***

Assuming that an open (n-Tier) architecture is used (browser-based user interface, database, business rules, and web server), the business rules associated with the system are separated from the rest of the architecture, thus it is easier to change the business rules (a common occurrence in government) than if they were included in the user interface or the database design.

### ***Extensive Development Toolset***

ERP systems provide for a single (often proprietary) toolset to support software configuration, customization, and ongoing administration of the system. Use of the toolset requires specialized training and knowledge. The development tools are also utilized in establishing workflow, security, and in implementing a software upgrade.

### ***Relational Database Technology***

Today's ERP systems utilize powerful relational database technology, which organizes records into a series of tables that may be connected by common "data". Relational databases facilitate ad hoc reporting and querying without the use of extensive programming knowledge.

### ***Application Modularity***

An ERP system consists of a series of application modules (e.g., general ledger, accounts payable, purchasing, asset management, payroll). A breakdown of typical

modules is described above. These application modules are designed to be “stand-alone” if necessary though some modules require that others be in place to fully utilize the functionality provided. This modular approach allows governments to selectively implement ERP functionality based on priorities, funding availability, and staff availability to implement and support the system. The entire ERP solution may be built on a “piece-meal” basis. Additionally, the government can substitute a third party solution in lieu of the ERP module if necessary to meet the government’s functional needs.

### ***Advanced Reporting Tools***

ERP systems typically provide a suite of ad hoc reporting /query tools to allow properly trained end users to develop their own custom reports. Electronic report routing capabilities are often provided with some of the systems.

### ***Security***

ERP systems provide a robust security function across all ERP modules, including role-based security, screen and field level security, and a comprehensive testing program to detect and correct potential security weaknesses.

### ***Automated Workflow and Approvals***

ERP systems provide automated workflow capabilities that support electronic document routing, review and approval, provides for inquiries on document status, and an efficient document filing and retrieval process. Automated workflow also facilitates the implementation of a “paperless” environment.

Automated workflow eliminates “paper document shuffling” and often times reduces the layers of approval.

### ***Drill-Down Capability***

ERP “drill-down” capabilities allow an end user to drill down on a field on a screen or report through successively lower levels of detail all the way to the initial entry source document.

### ***Comprehensive Audit Trail***

ERP systems provide on-line access to a comprehensive history of all changes made to a record in the system.

### ***Flexible Chart of Accounts***

The flexibility provided by the chart of accounts is the greatest factor in determining the usefulness of a financial system. ERP systems provide for a flexible and customizable chart of accounts structure that is supported by relational database technology, sophisticated ad hoc reporting tools to improve financial and budgetary reporting, and minimize the proliferation of “shadow” systems across state government.

### ***Desktop Software Integration***

ERP systems provide the ability to easily extract data from the ERP software into common desktop “office suite” applications such as the Microsoft Office suite for data manipulation and analysis. Most ERP software also support the import and export of data to/from the ERP system; this can facilitate the uploading and downloading of information from different systems or sources.

### ***Electronic Data Interchange (EDI)***

ERP systems are designed to support popular EDI standards and technologies:

- ◆ UN/EDIFACT
- ◆ ANSI X.12
- ◆ Internet EDI
- ◆ EDI/XML

### ***Remote Access***

As ERP functionality matures, the need will arise to grant access to those not traditionally considered users of ERP systems – vendors, mobile managers, staff working on specific grants, and all employees for self-service functions to name a few. A web-based system facilitates providing this access at a lesser cost to the State.

## ***WHICH AGENCIES WILL BE IMPACTED?***

An ERP system will impact all state agencies (excluding institutions of higher education). Every state agency interacts on some level with the State’s core systems, SEIS, TOPS, and STARS. Each agency must hire and pay employees, as well as purchase goods/services, process and pay vendor invoices. Agencies’ administrative resources will have to be trained so that transactions/processes can be properly executed in the new system. In addition, if an agency currently utilizes an automated interface to and/or from one of the following ***statewide systems to be replaced***, then that interface must be modified to properly interact with the ERP system:

- ◆ Accounting Reconciliation Package
- ◆ Applicant/Certification System
- ◆ Budget Request and Analysis Systems
- ◆ Computerized Employment Testing
- ◆ Data Capture
- ◆ Flexible Benefits (FLEX)
- ◆ Multitrak
- ◆ State Employee Information System (SEIS)
- ◆ Property of the State of Tennessee System Asset Management System (POST)

- ◆ Statewide Accounting and Reporting System (STARS)
- ◆ Tennessee Employment Application Monitoring System (TEAMS)
- ◆ Tennessee Insurance System (TIS)
- ◆ Tennessee On-line Purchasing System (TOPS)
- ◆ Training Information System

Additionally, each one the previously mentioned systems is administered by a State agency. These key functions will still require administration by key State personnel. In all likelihood, these SMEs will be recruited from the departments and divisions that manage the current administrative process. Therefore, these departments and divisions will have the additional impact of contributing personnel to support the new process.

## **“AS IS” PROCESS ANALYSIS**

### ***INTRODUCTION***

This portion of the ERP Automation Assessment Study Deliverable, presents the “As Is” process mapping approach, the potential process improvements and the major change impact areas.

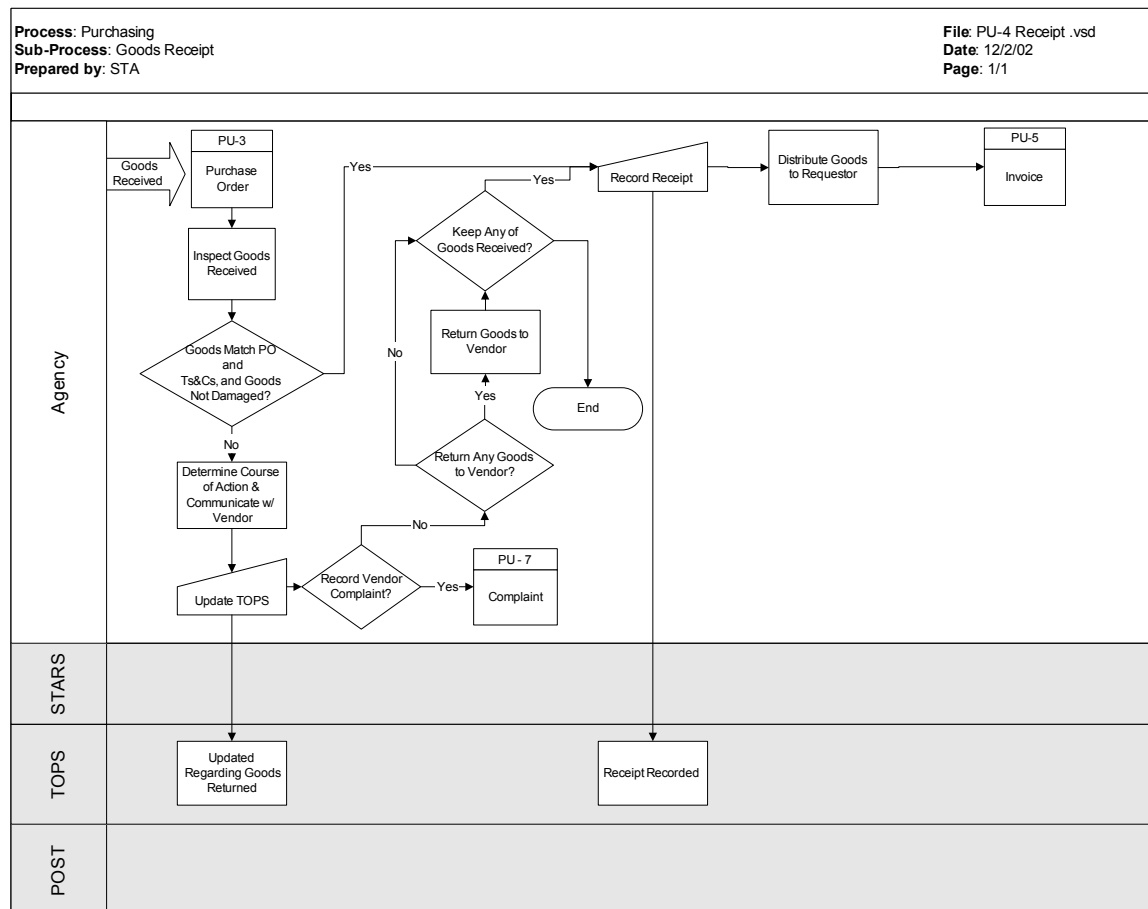
The “AS-IS” process mapping phase focused on the core set of State administrative functions that are most affected by the implementation of an ERP system. The phase supported the overall objective of the project of assessing the appropriateness of an ERP system for the State of Tennessee. The major functional areas included in the scope of work were financial/accounting, procurement, inventory, payroll, and human resources. Each functional area includes many business processes. For each process, the inputs, activities, outputs and improvement areas were documented. Furthermore, the process phase included:

- ◆ Confirming the processes and sub-processes in scope;
- ◆ Mapping critical processes;
- ◆ Validating process diagrams and supporting narratives; and
- ◆ Developing a final report.

### ***PROCESS DEFINITION TOOLS AND TECHNIQUES***

A process can be defined as a set of value-added activities that transform inputs into outputs for internal and/or external customers. Documentation of a process can be performed using words, visual representation or combination of the two. The visual representation or process map depicts activities, participants, system interaction and time. Microsoft Visio was used to create the process flow diagrams. A sample process is shown below.












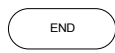
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This process provides an overview of the State’s goods receipt process. The horizontal bars represent key role, organizational units (e.g., agency), or systems (e.g., STARS and TOPS) that participate in the process. In general, time flows from the left side of the diagram to the right side. In this sample process, the goods are received and inspected by the agency. If the goods are not damaged and match the purchase order, then agency personnel manually enter a goods receipt transaction and deliver the goods to the requestor. If there is not a match or the goods are damaged, then agency personnel determine the appropriate course of action and perform a manual update to TOPS. The agency may choose to record a vendor complaint or return the goods to the vendor. If the agency is able to resolve the issue, then the goods receipt transaction is entered and the goods are distributed to the requestor.

Each action, decision or output in process is represented by a symbol and relationships between the symbols are represented by the connecting arrow.

The following symbols were used to document the State’s processes:

SYMBOL	NAME	DESCRIPTION
	Trigger	The event that initiates the sub-process.
	Document	A report, form, or any other paper document used in the process.
	Activity	An action taken during a sub-process.
	Decision	A decision point where a yes or no decision is reached.
	Manual Input	An end-user enters information into an administrative system.
	Sub-process Connector	A reference to another sub-process.
	Sequential Data	A file that is produced by a system.
	Direct Data	Information that is stored in an administrative system.
	Off-page Reference - Outbound	An outbound reference to information on another page within the sub-process.
	Off-page Reference - Inbound	An inbound reference to information on another page within the sub-process.
	On-page Reference	A reference to an activity on the same page of the sub-process.
	Terminator	An ending point to the processes.

In addition to the Visio diagrams, a standard process template was used to document each process. The templates, which were created using Microsoft Word, were used to capture the information displayed in the table below.

FIELD	DEFINITION
Process Name	Identifies the process name.
Process Identifier	Corresponds to the Process Library's numbering scheme.
Sub-Process Name	Identifies the name of the sub-process in the Process Library.
Sub-Process Identifier	Corresponds to the Process Library's numbering scheme.
Sub-Process Purpose and Objectives	Describes why the organization performs the sub-process and the key objectives of the sub-process.
Sub-Process Description	Provides a narrative overview of the sub-process.

FIELD	DEFINITION
Sub-Process Trigger(s)	Identifies the event that causes the sub-process to begin its execution (e.g., a month ends, a citizen submits a form, a citizen phones with an inquiry, etc.).
Key Sub-Process Participants	Lists the primary organizational units that involved in the execution of the sub-process.
Inputs	Lists the inputs to the sub-process including format, volume/time and suppliers.
Outputs	Lists the outputs from the sub-process including format, volume/time, and recipients.
Performance Measures Tracked: Measure	Documents the key metrics used to monitor the performance of the sub-process.
Performance Measures Tracked: Approx. Value	Documents recent approximate value of the measure (e.g., number of days for a cycle time measure, etc.)
Performance Measures Tracked: Target Value	Identifies the desired value/goal for the measure.
Laws, Regulations, and Policies That Govern Sub-Process	List of the laws, regulations, and policies that govern the sub-process.
Current Sub-Process Issues/Problems	Identifies issues and problems with the performance of the sub-process.
Improvement Opportunities: Opportunity	List the steps that could be taken that could potentially improve the sub-process.
Improvement Opportunities: Organizational Impacts	Lists constraints (e.g., laws, regulations, policies, etc.) that would need to be changed in order of the improvement opportunity to be realized.
Improvement Opportunities: Organizational Impact Type	Indicates whether the organizational impact that is listed is a law (L), regulation (R), policy (P), or a cultural (C) consideration.
Applications That Support the Sub-process: Application Name(s)	Lists the names/identifiers by which the organization identifies the application/system used in performing the sub-process, as well as the vendor's name for the application, if applicable.
Applications that Support the Sub-process: Technology Description	Provides a brief description of the application/system that should include the software used to develop the application, the hardware platform on which the system runs, the vendor's name (if any), etc.

## PROCESS APPROACH

A series of facilitated work sessions were conducted with the appropriate State functional subject matter experts (SMEs) and technical staff that support existing processes and administrative systems. The processes were visually depicted using Microsoft Visio with supporting narratives in Microsoft Word. The four-step approach is described below.

◆ **STEP 1:** Confirm the Processes within the Scope of the Effort

This initial step focused on the development of a project plan for initiating and completing the overall process documentation effort. Key activities included the:

- Confirmation of the critical business processes to be mapped;
- Definition of the objectives, scope, and timeline for documenting the critical business processes; and
- Identification of the key State functional and technical personnel that will participate in the effort.

The processes included in scope are outlined in the following chart.

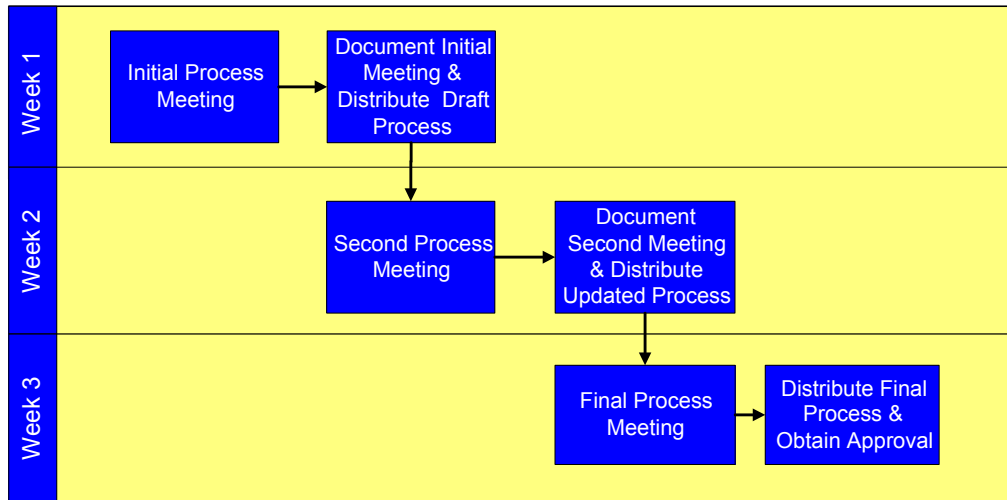
FUNCTIONAL AREA	PROCESSES
Accounts Payable	<ul style="list-style-type: none"><li>◆ Purchase Order Invoice</li><li>◆ Direct Invoice</li><li>◆ Procurement Card Invoice</li><li>◆ Payment Cancellation</li><li>◆ 1099 Reporting</li><li>◆ Vendor Maintenance</li></ul>
Accounts Receivable	<ul style="list-style-type: none"><li>◆ Maintain Customer Information</li><li>◆ Accounts Receivable</li><li>◆ Record Collections</li><li>◆ Prepare Deposits</li><li>◆ Reconciliation</li><li>◆ Write-Off of Receivables</li></ul>
General Ledger	<ul style="list-style-type: none"><li>◆ Chart of Accounts Maintenance</li><li>◆ Journal Entries</li><li>◆ Interagency Transactions</li><li>◆ Month-End Close</li><li>◆ Year-End Close</li></ul>
Inventory	<ul style="list-style-type: none"><li>◆ Stock Reorder</li><li>◆ Fill Customer Order</li></ul>

FUNCTIONAL AREA	PROCESSES
Purchasing	<ul style="list-style-type: none"> <li>◆ Requisition</li> <li>◆ Solicitations</li> <li>◆ Purchase Orders</li> <li>◆ Receipt of Goods or Services</li> <li>◆ Commodity Maintenance</li> <li>◆ Vendor Maintenance</li> <li>◆ Matching Process</li> <li>◆ Warehousing External Services</li> </ul>
Project/Grant Cost Allocation/ Labor Distribution	<ul style="list-style-type: none"> <li>◆ Project Processing</li> <li>◆ Grant Processing</li> <li>◆ Cost Allocation</li> <li>◆ Labor Distribution</li> </ul>
Applicant Services	<ul style="list-style-type: none"> <li>◆ Applicant Services</li> <li>◆ Testing</li> <li>◆ Applicant Selection</li> </ul>
Benefits Administration	<ul style="list-style-type: none"> <li>◆ Maintain participant data</li> <li>◆ Maintain enrollment</li> <li>◆ Termination of Coverage</li> <li>◆ Premium Procession</li> <li>◆ Vendor Payments</li> <li>◆ Deferred Compensation</li> <li>◆ Flex Benefits</li> </ul>
Classification and Compensation	<ul style="list-style-type: none"> <li>◆ Position Actions</li> <li>◆ Class Actions</li> <li>◆ Compensation Plan Management</li> <li>◆ Individual Salary Adjustment</li> </ul>
Payroll Administration	<ul style="list-style-type: none"> <li>◆ Maintain Employee Master Data</li> <li>◆ Supplemental Data</li> <li>◆ Payroll Audit</li> <li>◆ Payroll Calculation</li> <li>◆ Cancellation</li> <li>◆ Special Run</li> <li>◆ Warrants</li> <li>◆ In-Lieu Of Tax Reporting Year End Manual Checks</li> </ul>

FUNCTIONAL AREA	PROCESSES
Personnel Administration	<ul style="list-style-type: none"> <li>◆ New Hire</li> <li>◆ Maintain Employee Data</li> <li>◆ Personnel Action</li> <li>◆ Performance Evaluation</li> <li>◆ Disciplinary Action</li> <li>◆ Grievances</li> <li>◆ Employee Suggestion</li> <li>◆ Longevity</li> <li>◆ Mass Change</li> <li>◆ Reduction in Force</li> <li>◆ Approve Transactions</li> </ul>
Position Control	<ul style="list-style-type: none"> <li>◆ Position Approval</li> </ul>
Training and Career Development	<ul style="list-style-type: none"> <li>◆ In Service Training Pre/Post Class</li> <li>◆ In Service Training Departmental</li> <li>◆ Out of Service Training</li> </ul>
Time Reporting and Leave Accounting	<ul style="list-style-type: none"> <li>◆ New Hire</li> <li>◆ Time Entry</li> <li>◆ Off-cycle Adjustments</li> <li>◆ Leave Accrual</li> <li>◆ Leave of Absence</li> <li>◆ Sick Leave Bank</li> <li>◆ Sick Leave Transfer</li> </ul>

◆ **STEP 2: Document Critical “As Is” Processes**

Prior to the initial meeting, the STA consultants reviewed systems documentation, policies and procedures to obtain an overall understanding of the current environment. The “As Is” processes also required a series of facilitated work sessions with the appropriate State personnel (i.e., functional SMEs, IT management, and technologists that support the existing administrative systems) from the central departments to document the existing business processes. Over the course of three weeks, the consultants and State SMEs documented major work activities, deadlines, decision points, systems, and manual “hand-offs” associated with a particular process. The work session schedule is represented by the following exhibit.



◆ **STEP 3: Validate Process Diagrams and Supporting Narratives**

At the end of the three weeks, the processes were routed to the appropriate State SME for final review.

The key SMEs for each area were as follows:

FUNCTIONAL AREA	SUBJECT MATTER EXPERTS
Accounts Payable	◆ Mike Corricelli, Finance and Administration ◆ David Dealy, Finance and Administration ◆ Terry Mason, Finance and Administration ◆ Clyde Phillips, Finance and Administration
Accounts Receivable	◆ Mike Corricelli, Finance and Administration ◆ Kristi Couch, Finance and Administration ◆ David Dealy, Finance and Administration ◆ Clyde Phillips, Finance and Administration ◆ Rhonda Hicks, Finance and Administration
General Ledger	◆ Mike Corricelli, Finance and Administration ◆ David Dealy, Finance and Administration ◆ Clyde Phillips, Finance and Administration
Inventory	◆ David Silcox, Department of Corrections ◆ Toni Stuart, General Services ◆ Chris Gingles, Mental Health Dev. Disab. ◆ Lance Goad, Transportation ◆ Garland Johnson, Department of Corrections ◆ Catherine Posey, Department of Corrections

FUNCTIONAL AREA	SUBJECT MATTER EXPERTS
Purchasing	<ul style="list-style-type: none"> <li>♦ John Bissell, General Services</li> <li>♦ David.L Brooks, General Services</li> <li>♦ Michael Hayes, General Services</li> <li>♦ Richard Mayfield, General Services</li> <li>♦ Tina Pennington, General Services</li> <li>♦ George Street, General Services</li> </ul>
Project/Grant Cost Allocation/ Labor Distribution	<ul style="list-style-type: none"> <li>♦ Kristi Couch, Finance and Administration</li> <li>♦ David Dealy, Finance and Administration</li> <li>♦ Clyde Phillips, Finance and Administration</li> <li>♦ Rhonda Hicks, Finance and Administration</li> </ul>
Applicant Services	<ul style="list-style-type: none"> <li>♦ Mike O'Neal, Department of Personnel</li> <li>♦ Tony Perry, Department of Personnel</li> <li>♦ Phil Morrow, Department of Personnel</li> <li>♦ James C. Johnson, Department of Personnel</li> <li>♦ Pam J. Parker, Department of Personnel</li> </ul>
Benefits Administration	<ul style="list-style-type: none"> <li>♦ Bob Smith, Finance and Administration</li> <li>♦ Debbie W. Smith, Finance and Administration</li> <li>♦ Bobbye Hammond, Finance and Administration</li> <li>♦ T.G. Smith, Finance and Administration</li> <li>♦ Eddie Hennessee, Treasury</li> </ul>
Classification and Compensation	<ul style="list-style-type: none"> <li>♦ John E. Moore, Department of Personnel</li> <li>♦ Austin Ray, Department of Personnel</li> <li>♦ Susie Tucker, Department of Personnel</li> <li>♦ Leesa Bray, Finance and Administration</li> <li>♦ Johnny Holder, Department of Personnel</li> </ul>
Payroll Administration	<ul style="list-style-type: none"> <li>♦ Bobbye Hammond, Finance and Administration</li> <li>♦ Harry Broughman, Finance and Administration</li> <li>♦ Patrice Steinhart, Finance and Administration</li> <li>♦ Pam J. Parker, Department of Personnel</li> <li>♦ Elizabeth Sneed, Department of Personnel</li> <li>♦ Johnny Holder, Department of Personnel</li> </ul>
Department of Personnel Administration	<ul style="list-style-type: none"> <li>♦ John E. Moore, Department of Personnel</li> <li>♦ Patsy McGee, Department of Personnel</li> <li>♦ Pam J. Parker, Department of Personnel</li> <li>♦ Johnny Holder, Department of Personnel</li> </ul>

FUNCTIONAL AREA	SUBJECT MATTER EXPERTS
	<ul style="list-style-type: none"> <li>◆ Elizabeth Sneed, Department of Personnel</li> </ul>
Position Control	<ul style="list-style-type: none"> <li>◆ Johnny Holder, Department of Personnel</li> <li>◆ John E. Moore, Department of Personnel</li> <li>◆ Rick Newton, Division of Budget</li> </ul>
Training and Career Development	<ul style="list-style-type: none"> <li>◆ Lynn Goodman, Department of Personnel</li> <li>◆ Cindy Saladin, Department of Personnel</li> <li>◆ Johnny Holder, Department of Personnel</li> </ul>
Time Reporting and Leave Accounting	<ul style="list-style-type: none"> <li>◆ Martha Sneed, Mental Health Dev. Disab.</li> <li>◆ Patsy McGee, Department of Personnel</li> <li>◆ Pam J. Parker, Department of Personnel</li> <li>◆ Johnny Holder, Department of Personnel</li> <li>◆ Donna Pewitt, Department of Personnel</li> </ul>

- **STEP 4: Develop Final Report.** The *Final Report of “As Is” Business Processes* documents the State’s existing business processes and rules in a visual “flowchart” format and narrative description. This report is included in Appendix A. A summary of potential process improvement opportunities and associated organizational impacts follows:

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
<b>Applicant Services</b>			
AS-1	Applicant Processing	Ability to process applications immediately upon receipt	
		Ability for applicant or DOP to review status of all applications and registers for an applicant	
		Applications for state jobs can be completed on-line by prospective applicants by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation
		Reduced paperwork associated with the job application process	Staff adjustment to a "paperless" environment
		Enhanced search capabilities for matching current state employees with the skill set requirements for open positions in state government.	
		Integration of TEAMS and SEIS	
AS-2	Applicant Testing	Accurate on-line notification of applicant test results, including component scores	
		Automation of test notification process based on the testing required and the location requested	
		Automatic roll-up of component scores	
		Email notification to applicants of scheduled testing, results, status, etc.	
AS-3	Applicant Selection	On-line review of status of all applications/registers for an applicant	
		Automation of RIF process	

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
<b>Benefits Administration</b>			
BA-1	Maintain Participant Data	Participant self-service for maintaining basic information on-line by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to participant
BA-2	Maintain Enrollment	Changes to benefits during open enrollment can be completed by employees on-line by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to participant
BA-3	Termination of Coverage	Synchronization with SEIS – disallow direct entry of employment status changes, etc. directly into TIS; elimination of quarterly manual synchronization	This would require all agency personnel to enter employment related status changes in a timely manner
<b>Payroll</b>			
PY-1	Maintain Employee Data	Maintenance of employee information by third parties for information similar to deferred compensation and union dues (credit union, charities, etc.)	Less manual input by Department of Personnel and by personnel/payroll officers in the agencies; culture impact as personnel officers must accept less control of input
		Payroll remittance advice data can be accessed on-line by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
PY-1 (Cont.)	Maintain Employee Data (cont.)	W-4 data can be accessed and updated by employees on-line by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; culture impact as personnel officers must accept less control of input; shifting of responsibility for data to participant
		Flexible “lockout” procedures	Shifts responsibility to agencies for data accuracy
PY-2	Supplemental Data	Automation of manual payroll input (especially retroactive changes and termination payments of leave balances)	Additional automation of payroll functions would reduce time consuming preparation of supplemental input and increase the accuracy of data provided by the agencies; shifts responsibility for accuracy to agencies
PY-3	Payroll Audit	Improved exception reporting (consolidating errors to a single report by employee)	
		Flexible lockout to allow for entry by agencies	Reduces workload for personnel and payroll, and increases accuracy by placing data correction at the source of data capture; shifts responsibility for accuracy to agencies
PY-4	Payroll Calculation	Automation of transactions that require special run (ex-terminated employees)	Reduction of manual calculations by agencies and personnel; reduction of errors

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
PY-4 (Cont.)	Payroll Calculation (Cont.)	Automation of retroactive pay changes (individual and bulk)	Reduction of manual calculations by agencies and personnel; reduction of errors
		Automation of liens and garnishments (200 new and 300 recurring per pay period)	Currently approximately 500 of these must be calculated and input each pay period; this would free up substantial resources if automated and reduce errors and follow-up actions by individuals receiving these payments
		Provide for service of garnishments to F&A Payroll rather than each Commissioner; central processing of garnishments would simplify process and speed implementation	Change in statute is required; shift in change of responsibility
		Ability to re-run payroll (for department/division or entire payroll)	
		Modify statutory time limits on payments (grievances) that require special handling (have these coincide more closely with pay periods)	Change in statute is required; reduced warrant processing and special run input
PY-5	Cancellation	Automation of cancellation and re-issue process	Simplify cancellation process; control shifts to agency
PY-6	Special Run	Calculate deductions correctly as deductions are currently not taken on special runs	Avoid possible legal issues
		Automation of non-standard longevity processing	Provide for automation of longevity date adjustments, thus eliminating manual adjustments

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
PY-7	Warrant Processing	Process individual checks through payroll	Allows more timely and accurate issue of individual out of cycle checks; this will enhance the accuracy of payroll data as well as ensuring timely processing
PY-9	Tax Reporting	Consolidation of all tax reports to a single report	Eliminates duplicated entry and possible errors
PY-10	Year-End Processing	Allow agencies and employees to request duplicate W-2's on-line	
PY-11	Manual Checks	Automation of the production of manual checks	
<b>Personnel Administration</b>			
PA-1	New Hire		
PA-2	Maintain Employee Data	Basic employee information (e.g., address change) can be completed on-line by employees by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; less manual input by Department of Personnel and by personnel/payroll officers in the agencies; change management issue of shifting responsibility for data to employee
PA-3	Personnel Action	Ability to define processing steps and rules	Simplify process changes and training
PA-10	Reduction in Force	Provide automated support for preparation of RIF list, and the subsequent processing of layoffs and other personnel transactions	

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
Position Control			
PC-1	Position Approval	Automation of the approval/rejection process; electronic notification to the agencies that the position was either approved or rejected	
		Automation of the creation of the position once it has been approved; once approved, electronic process to automatically create the position and send it to the Class/Comp process (CC-1)	
Time Reporting and Leave Accounting			
TL-2	Time Entry	Send automation of A&L for non executive branch agencies	This would simplify payroll processing and reduce errors; would require offline departments to adopt DOP policies
		Employees can enter their own time information by utilizing self-service time entry functionality through a web browser or kiosk	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to employee
TL-3	Off-Cycle Adjustments	Automation of the calculation of retroactive transactions	
TL-5	Leave of Absence	Automation of Family Medical Leave Act (FMLA) processing	
		Employees can view their leave balances and request time off by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation
TL-6	Sick Leave Bank	Automation of sick leave bank processing	

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
<b>Training and Career Development</b>			
TR 1	In-Service Training (Pre-Class/Post-Class)	Automated alert for 17-day & 14-day notifications sent	
		Automation and integration	
		Scheduled opportunities	
		Automation of CEU update to employee record	
		Automation of checklist	
		Self-service for training announcement, CEU transcripts	
		For billing purposes, automation of an inter-agency process that will locate employees that have attended a class, left the agency and moved outside the agency Process should search by SSN	
		Employees can register for available training classes by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to employee
TR 2	In-Service Training (Departmental)	Automation & integration	
		Employees can register for available training classes by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to employee
TR 3	Out-Service Training	Automation of the entire process	

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
<b>Accounts Receivable</b>			
AR-1	Customer Maintenance	Establish a customer file for accounts receivable that is independent of the vendor file used for purchasing and accounts payable activities	New standardized process for all agencies with receivables that are not maintained in a programmatic system to follow
AR-2	Accounts Receivable	Provide aging reports and schedules	New standardized process for all agencies with receivables that are not maintained in a programmatic system to follow
		Customer service improvements associated with standardized billings	New standardized process for all agencies with receivables that are not maintained in a programmatic system to follow
		Automatic generation of customer statements with invoice and interest detail	New standardized process for all agencies with receivables that are not maintained in a programmatic system to follow
		Automatic generation of dunning notices	New standardized process for all agencies with receivables that are not maintained in a programmatic system to follow
		Access to dunning history for each customer	New standardized process for all agencies with receivables that are not maintained in a programmatic system to follow

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
AR-3	Deposits	Automation of journal voucher processing, including workflow between organizations	This would result in a change in the process of normal business procedures for applicable State organizations
AR-6	Collection	Interface RIPS detail into FDAS	System change and minor training required
<b>Accounts Payable</b>			
AP-1	Vendor Maintenance	Basic vendor information (e.g., address change) can be maintained on-line by vendors by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to vendor
		Eliminate vendor interfaces	
		Single consolidated vendor file for purchasing and accounts payable use reduces duplicate data entry and provides for consistent entry of vendor information	System impact and training required; issue of responsibility to maintain
AP-2	Invoice	Require all agencies to use TOPS or implement full ERP Procurement / eProcurement functionality	Constitutional change required for non-executive agencies and law change required for agencies exempted from using TOPS
AP-3	Payment Card	Increase the limit up to \$2,000 for acquiring goods and services with a payment card and interface the purchasing information back to TOPS	TOPS systems change required and minor training impact
AP-4	Disbursements	Remittance advice information can be accessed on-line by vendors by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; currently spending \$600,000 on postage

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
AP-4 (Cont.)	Disbursements (Cont.)	Reduction in paper processing and accounts payable cycle time	
		Vendors can inquire into the status of their outstanding payments by utilizing self-service functionality through a web browser or kiosk	Internet access and training may be issues in implementation; allows for redirecting accounts payable staff devoted to answering vendor inquiries to more value-added tasks
		Manual matching of purchasing / payables documents as an automated three-way matching process (purchase order, invoice, receiving report) is performed	Allows for the redirecting of staff time from manual matching to exception processing
		Employees can complete expense reimbursement reports by utilizing self-service functionality through a web browser or kiosk, and obtain proper approvals through pre-defined workflow capabilities	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to vendor; allows for redirecting accounts payable staff devoted to answering vendor inquiries to more value-added tasks
		Employees check the status of travel and expense reimbursements by utilizing vendor payment status inquiry functionality through a web browser or kiosk	Internet access and training may be issues in implementation; allows for the redirection of accounts payable staff devoted to answering these inquiries to more value-added tasks
AP-5	1099 Reporting	Automatic generation of 1099s	

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
General Ledger			
GL-2	Journal Voucher - Entry	Current J-type process is very paper based and subject to errors; replace with workflow that includes document attachment features	Train individuals in the use of workflow
GL-3	Journal Voucher - Interagency	Automation of J-type voucher preparation as current J-type vouchers require providing and receiving agency to fill out their sections manually	System change required to provide two agencies access to same document (possible security implications); would also require training for new process
Project and Grant Accounting			
PG-1	Project Processing	Provide enhanced project accounting functionality	
PG-2	Grant Processing	Automation of grant drawdown processing	
PG-3	Cost Allocation	Allocations across divisions	Possible Legal ramifications
		Greater flexibility with less complexity	Possible training and control issues if allocations are allowed across divisions or agencies; some divisions and/or agencies may not want to have allocations across their organization
PG-4	Labor Distribution	Allocate for portions of a division	
		Allocate for monthly payrolls	
Inventory			
IN-1	Stock Reorder	Currently purchase orders must be manually entered into TOPS and FIMS; build or buy (e.g., ERP) system integration that would eliminate the need to enter purchase orders and receipt information into FIMS and TOPS	

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
IN-1 (Cont.)	Stock Reorder (Cont.)	Implement system functionality that would cause reorder points in the system to trigger the generation of requisitions for the items to be reordered The requisitions could then be manually assigned to Buyers (within the system) or be assigned by the system based on commodity code, buyer workload, and other factors	
		Implement the ability for the Inventory system to transmit purchase orders directly to the receiving vendor's system	
		Reduction in inventory levels required to be maintained and inventory carrying costs	
IN-2	Fill Customer Order	Implement bar-code technology to aid in picking from stock and updating inventory balances	
		Implement the ability to send, electronically, invoices to customers that do not use STARS	
Procurement / eProcurement			
PU-1	Requisition	Improve commodity code identification and assignment by implementing a state-of-the-art, automated search engine	Requestors often have difficulty assigning correct commodity codes
PU-2	Solicitation (Informal)	Web-enable the solicitation process	Internet access and training may be issues in implementation; possible shift to the use of electronic signatures/authentication

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
PU-2 (Cont.)	Solicitation (Informal) (Cont.)	More competition for the State's business through more dynamic pricing models (e.g., vendor catalogs that can be accessed by the public, reverse auctions)	Internet access and training may be issues in implementation
PU-3	Award Document	Implement the ability to send purchase orders directly to the receiving vendor's system (i.e., no manual entry on the vendor's part)	Electronic signatures / authentication
		Implement the ability to post award information on the web directly from the purchasing application	
PU-4	Goods Receipt	On-line receipt of goods by utilizing self-service receiving functionality through a web browser or kiosk	Internet access and training may be issues in implementation
PU-5	Invoice Receipt	Implement the ability to receive invoices electronically from vendors and have the invoice automatically posted to the State's system (i.e., no manual entry)	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to vendor; allows for redirecting state staff to more value-added tasks
PU-6	Vendor Maintenance	Implement Internet-based vendor self-service that is fully integrated with the Purchasing system for registration and for the maintenance of certain data items	Internet access and training may be issues in implementation; change management issue of shifting responsibility for data to vendor; allows for redirecting state staff to more value-added tasks

PROCESS ID REF.	PROCESS ID TITLE	PROCESS IMPROVEMENT OPPORTUNITIES	ORGANIZATIONAL IMPACT
PU-6 (Cont.)	Vendor Maintenance (Cont.)	Increased vendor access to bid opportunities through the use of “push” technology to notify vendors of bid opportunities (based on the commodities they are registered to provide) through industry-standard email applications	Internet access and training may be issues in implementation; more competition for goods and services
		Single consolidated vendor file for purchasing and accounts payable use reduces duplicate data entry and provides for consistent entry of vendor information	System impact and training required; issue of responsibility to maintain
PU-7	Professional Services Contract	Web-enable the solicitation process	Internet access and training may be issues in implementation; possible shift to the use of electronic signatures/authentication
		Automated workflow approval process	

## CHANGE MATRIX

### **WHAT IS THE CHANGE MATRIX?**

One stated objective of the ERP Automation Assessment Study was to avoid ending up with a quickly outdated cost document, but to instead have a “living”, readily accessible analysis tool that would serve as the primary information repository for the project and be used to answer “what if” questions regarding the results of the Study. The Change Matrix is a tool, which was developed as part of the ERP Automation Assessment Study, that provides this analytical capability.

The Change Matrix is a PC-based software application, written in Microsoft Access, that contains robust reporting and “what if” analysis functionality. State personnel will use the Change Matrix to execute analytical reports and run “what if” scenarios to determine the results of various ERP implementation options, such as alternative ERP module deployment strategies and durations.

### **BUILDING THE CHANGE MATRIX**

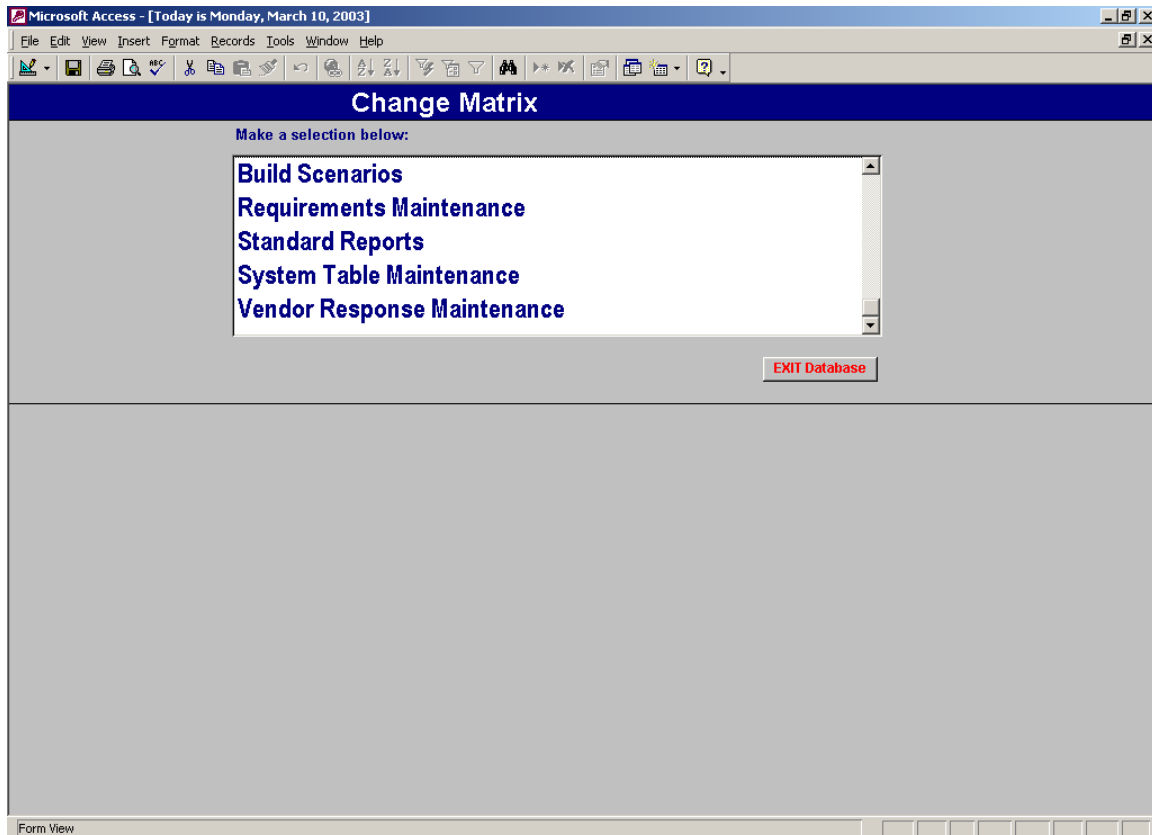
A number of design sessions were held with key State personnel to define the vision for, and the purpose of, the Change Matrix. Based upon the information gathered during these sessions, the major deliverables of the Study and other data components were identified and designed into the Change Matrix. These deliverables and data components include:

- ◆ “To Be” business requirements;
- ◆ ERP vendor responses to the RFI that was issued as part of the Study regarding:
  - Their software’s ability to meet the State’s business requirements, and
  - Planning estimates of costs to acquire and implement their ERP software;
- ◆ CBA summary cost schedules;
- ◆ Agencies;
- ◆ ERP modules;
- ◆ ERP sub-modules;
- ◆ Laws, rules, and regulations;
- ◆ “Owners” of business requirements; and
- ◆ ERP vendors.

After the information noted above was loaded into the Change Matrix, queries and reports were designed to provide users with a tool to analyze the data. State personnel have assumed ownership of the tool; therefore, new system enhancement requests, including reports, will be referred to State personnel.

## MAIN MENU

The main menu of the Change Matrix application is shown below. This is the first screen that users see after entering the application. Users can navigate to various screens to perform numerous functions, including building scenarios, running standard reports, and reviewing vendor responses to requirements.

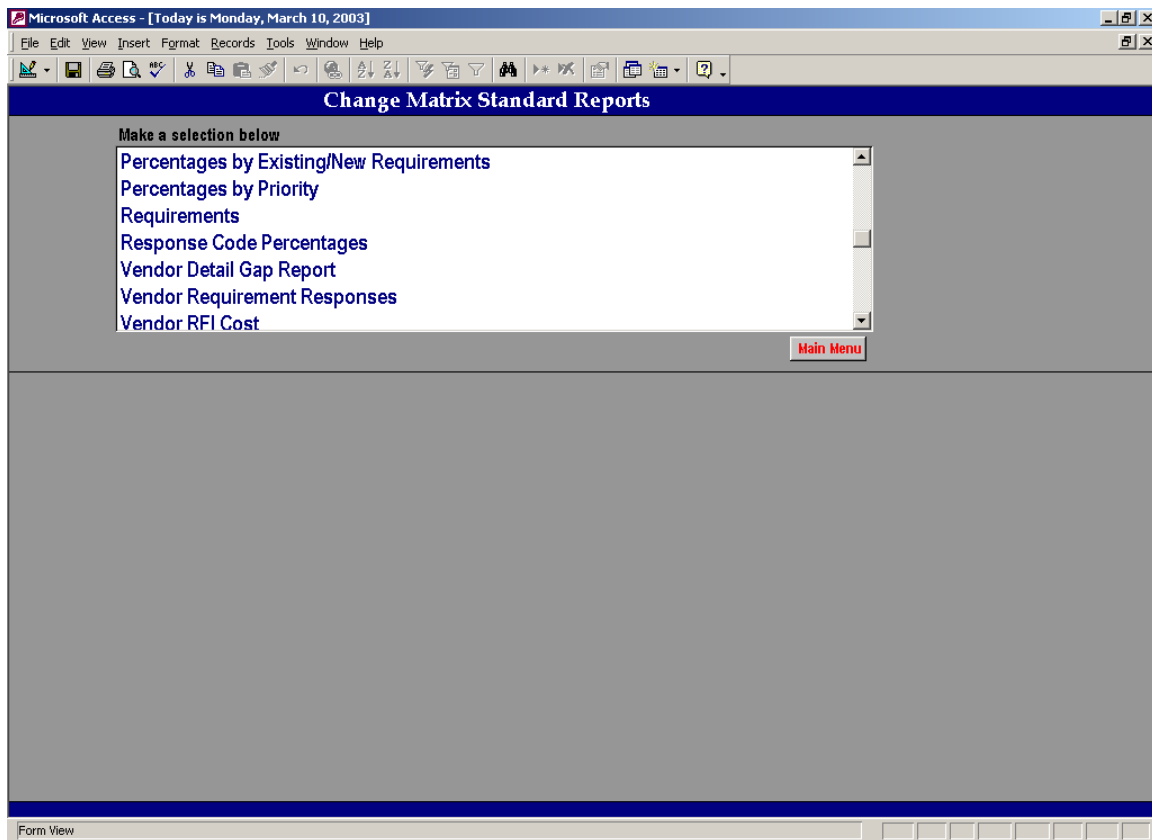


The screenshot shows a Microsoft Access window titled "Microsoft Access - [Today is Monday, March 10, 2003]". The menu bar includes File, Edit, View, Insert, Format, Records, Tools, Window, and Help. The toolbar contains various icons for file operations and database functions. The main form, titled "Change Matrix", has a dark blue header. Below the header, it says "Make a selection below:". A list box contains five options: "Build Scenarios", "Requirements Maintenance", "Standard Reports", "System Table Maintenance", and "Vendor Response Maintenance". To the right of the list box is a vertical scrollbar. Below the list box is a red button labeled "EXIT Database". The status bar at the bottom left indicates "Form View".

## STANDARD REPORTS

The Change Matrix contains a number of standard reports. Once a report has been generated, the information contained in the report can be further analyzed by exporting the report to Microsoft Word or Microsoft Excel.

The Standard Reports menu is shown below.

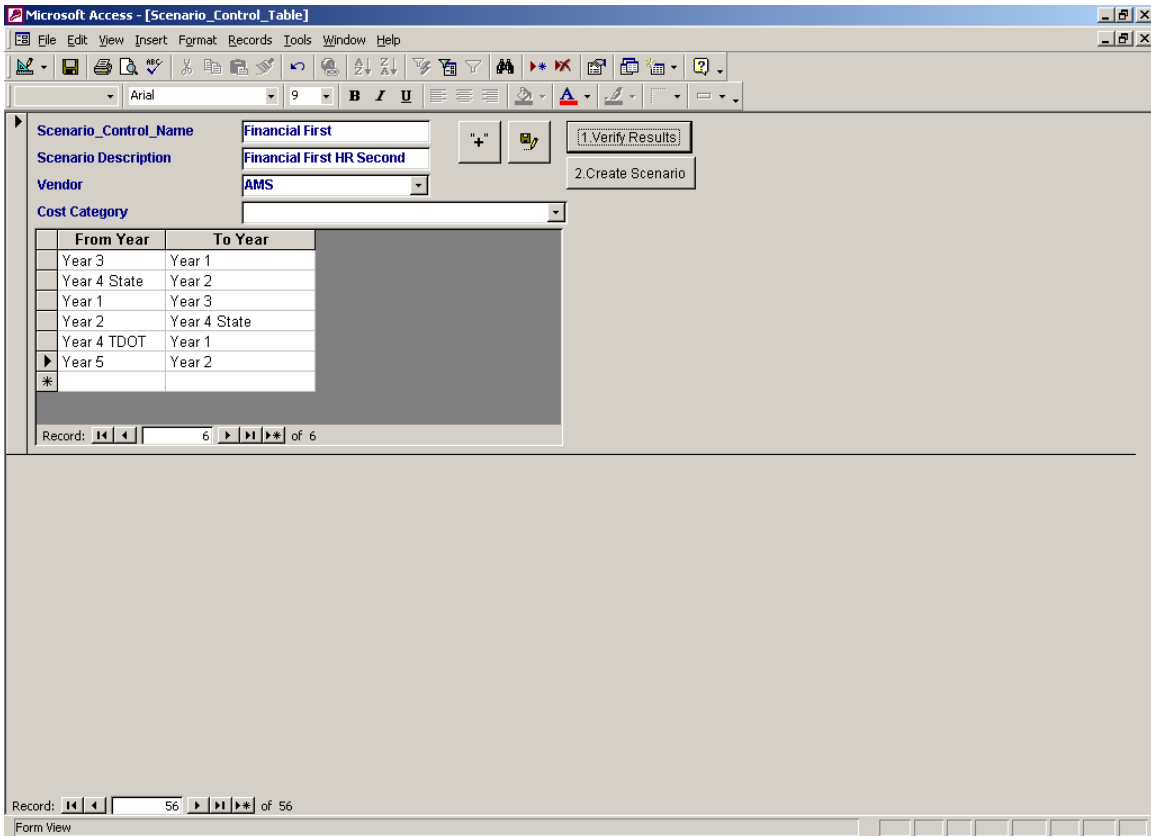


A description of each of the system's standard reports is provided below.

- ◆ **Percentages by Existing/New Requirements** – a report of vendor requirement responses by sub-module and vendor, for existing and new requirements
- ◆ **Percentages by Priority** – a report of vendor requirement responses by sub-module and vendor, for the requirement priorities of mandatory, critical, and desired
- ◆ **Requirements** – a report of requirements by module
- ◆ **Response Code Percentages** – a report of requirement percentages by sub-module and vendor
- ◆ **Vendor Detail Gap Report** – a report by vendor of requirements that cannot be met with standard functionality with commercial off-the-shelf (COTS) software
- ◆ **Vendor Requirement Responses** – a report of vendor responses by sub-module
- ◆ **Vendor RFI Cost** – a report of ERP costs by vendor

## SCENARIO TOOL

As mentioned previously, users can evaluate “what if” implementation scenarios using the Change Matrix. Each scenario can be named and saved.



Microsoft Access - [Scenario\_Control\_Table]

File Edit View Insert Format Records Tools Window Help

Scenario\_Control\_Name: Financial First

Scenario Description: Financial First HR Second

Vendor: AMS

Cost Category: [Dropdown]

Buttons: [Add], [Delete], [1. Verify Results], [2. Create Scenario]

From Year	To Year
Year 3	Year 1
Year 4 State	Year 2
Year 1	Year 3
Year 2	Year 4 State
Year 4 TDOT	Year 1
Year 5	Year 2
*	

Record: 6 of 6

Record: 56 of 56

Form View

In this example, planning cost estimates are moved from years 3, 4, and 5 to years 1 and 2, and the cost estimates for years 1 and 2 are moved to years 3 and 4. This scenario answers the question: “what would be the cost of implementing Financial/Procurement, including the Department of Transportation, in years 1 and 2, and implementing HR/Payroll in years 3 and 4?”

## RECOMMENDED PROCUREMENT STRATEGY

The procurement of ERP software and associated implementation services is a long process. Typically, Request for Proposal (RFP) development, proposal evaluation and selection, and contract negotiations take a minimum of six (6) months to complete. Following is a recommended strategy and approach for acquiring the ERP software and associated implementation services. The strategy was developed based on input from the following:

- ◆ Meetings of the ERP Work Group,
- ◆ Reviews completed by the Office of Contract Review of the Department of Finance and Administration,
- ◆ Meetings with representatives of the Comptroller of the Treasury, and
- ◆ STA's prior experience in assisting public sector organizations in acquiring ERP systems.

### RECOMMENDED STRATEGY AND APPROACH

Following are the recommended tasks that should be undertaken in order to ensure a competitive and fair procurement process if funding is provided for the acquisition and implementation of an ERP system:

1. **Final Project Scoping.** The ERP Work Group will re-convene to make final decisions regarding the software functionality and services to be acquired. Some options available to the State include:
  - ◆ Acquiring full ERP (Financial Management, Human Resources/Payroll, Fleet Management, and the Tennessee Department of Transportation (TDOT) specific Project Accounting and Materials Management functionality) software and associated implementation services.
  - ◆ Acquiring Core ERP (Financial Management and Human Resources/Payroll functionality only) software and associated implementation services.
  - ◆ Acquiring Human Resources/Payroll software and associated implementation services only.
  - ◆ Acquiring Human Resources/Payroll software and associated implementation services only, but “lock in” the cost of buying the remaining Core ERP functionality (Financial Management) in the future at today's pricing by including the remaining core ERP functionality in this competitive procurement process. All software and services that are procured, including “locking in” the cost for remaining modules to be implemented in the future, must be a part of the evaluation process, which is part of the competitive bid, requiring evaluation.

The above options could also include acquiring more robust, third party software to meet the State's fleet management business requirements as well as alternatives for meeting the TDOT-specific Project Accounting and Materials Management requirements. Should a decision be made to include TDOT in the project scope, additional decisions will be required to address TDOT's involvement in the implementation and deployment effort (e.g., Will TDOT serve as a pilot for the Financial Management implementation project or be implemented at a later date?).

**The final decisions, resulting from this task, will impact all remaining tasks in the Procurement Strategy.**

- 2. Formalize the Project Structure.** To achieve a team approach and ensure proper participation from all project stakeholders, it is critical that the following participants and groups be finalized at this time:

- ◆ Project Sponsors
- ◆ Evaluation Committee
- ◆ Key Subject Matter Experts (will provide input to the Evaluation Committee)
- ◆ Project Manager (optional at this time)

- 3. Validate the System Requirements.** Functional and technical system requirements have been developed as part of the ERP Automation Assessment Study (see Appendix B). Requirements were specifically developed for the following functional areas:

- ◆ Financial Management
- ◆ General Ledger / Budget Control
- ◆ Accounts Payable / Travel
- ◆ Accounts Receivable / Cash Receipts / Cash Management
- ◆ Budget Development (including Performance-Based Budgeting)
- ◆ Cost Accounting / Allocation
- ◆ Project Management and Grant Accounting
- ◆ Purchasing
- ◆ Inventory
- ◆ Asset Management
- ◆ Human Resources
  - Employee Self-Service
  - Personnel Administration
  - Payroll Administration
  - Position Control

- Recruitment and Applicant Tracking
  - Training and Employee Development
  - Compensation
  - Time Reporting
  - Employee Leave Accounting
  - Benefits Administration (insurance only)
- ◆ Fleet Management
  - ◆ TDOT-specific Project Accounting and Materials Management
- Additionally, technical requirements were developed to address the following areas:
- ◆ Technical and architectural requirements;
  - ◆ System performance;
  - ◆ Security;
  - ◆ System navigation and user friendliness;
  - ◆ System management;
  - ◆ Automated workflow and electronic approvals; and
  - ◆ Data warehousing and both standard and ad hoc reporting requirements.

The requirements prepared for this study were acceptable for the intended purposes of the Request for Information (RFI) that was used to determine whether ERP software in the marketplace today can meet the State's business needs; however, detailed requirements must be defined for inclusion in the RFP. Additional time and effort should be undertaken to perform a final validation of the existing requirements to ensure they properly reflect the State's business needs at an adequate level of detail. Specifically, additional review is recommended for areas such as Personnel Administration, Benefits Administration, Budget Development (to ensure that the requirements address any new legislative initiatives), and DOT-specific business needs. **Only those requirements that will be included in scope, based on decisions made during the Final Project Scoping session(s) in Task 1 above, will be validated at this time.**

Based on the Interface Model, additional *interfacing system* requirements should be documented to address automated, bi-directional interfaces that must be developed between the ERP system and other administrative systems that will not be replaced. **Only those interfacing systems that will be impacted by final scoping decisions made in Task 1 above will be addressed at this time.**

It is critical that the system requirements that are included in the procurement document properly reflect the State's needs, as the awarded vendor's response to the requirements will become part of the final contract. The system requirements are used as a benchmark

for designing and configuring the ERP system and will be used to determine whether the system meets the State's business needs as part of the system acceptance process.

- 4. Develop Project Charter.** The project charter provides focus and structure to key aspects of the project. The project charter formally acknowledges the existence of a project, and provides the project manager with the authority to utilize state resources on project activities. The new project charter should address (but is not limited to):

- ◆ Project objectives;
- ◆ Criteria for defining project success;
- ◆ Project scope (based on final scoping decisions made in Task 1); and
- ◆ Authorization to obtain and apply organizational resources to carry out project activities.

- 5. Develop a Project Plan.** The project plan is used to guide project execution and control. The primary uses of the project plan are to document planning assumptions and decisions, facilitate communications among stakeholders and project team members, and document approved scope, cost, and schedule baselines. Components of the project plan include (but are not limited to):

- ◆ Previously developed and approved project charter;
- ◆ Detailed project scope statement;
- ◆ Project organizational structure and staffing plan;
- ◆ Project planning assumptions and constraints;
- ◆ Roles and responsibilities of Project Sponsors, Evaluation Committee, Subject Matter Experts, Project Manager, and Project Team members;
- ◆ Project timeline;
- ◆ A work breakdown structure (WBS) that address all the tasks that must be completed as part of the State's acquisition process at a detailed level, and future tasks beyond the acquisition process at a high level. The WBS will include tasks, start and end dates for each task, and resources assigned to each task, as well as dependent relationships among tasks. Milestones and deliverables will also be included in the WBS;
- ◆ Initial risk management plan;
- ◆ Issue resolution process;
- ◆ Deliverable review process;
- ◆ Project status/progress reporting; and
- ◆ Documentation standards.

**6. Develop Formal Evaluation Process.** The purpose of a formal evaluation process is to define a structured, comprehensive, and objective approach for evaluating proposals received and to mitigate the risk of potential protests. The evaluation process as agreed upon by the Project Sponsors and Evaluation Committee will be documented in a confidential Evaluation Guide (subject to open records law after award) that will include the following:

- ◆ Evaluation process flow and timeline of key milestones;
- ◆ Evaluation criteria to be used in the selection process (to be included in the purchasing instrument);
- ◆ Business process scripts (scenarios) to be used during vendor presentations/demonstrations;
- ◆ Evaluation scoring system to be followed (including scoring documents and instructions for completing); and
- ◆ Evaluation Committee membership and organization, including roles and responsibilities.

The categories that we recommend be considered in the evaluation of proposals are Qualifications and Experience, Technical Approach, Vendor Presentation and Software Demonstration (including compliance with functional and technical requirements), and Cost. In accordance with the Department of Finance and Administration's (F & A) Office of Contract Review standards, the following formula is used to determine the points that a potential vendor shall receive for the Cost Proposal:

$$\frac{\text{lowest proposed cost for evaluation}}{\text{proposed cost for evaluation being evaluated}} \times \frac{\text{maximum cost}}{\text{points}} = \frac{\text{score of cost}}{\text{proposal being evaluated}}$$

We recommend that "maximum points" be awarded for each category as follows:

CATEGORIES	MAXIMUM POINTS POSSIBLE
General Proposer Qualifications and Experience	30
Technical Approach	20
Vendor Presentation and Software Demonstration (including compliance with functional and technical system requirements)	20
Cost (Note: 30 points is required by F&A's Office of Contract Review and Comptroller of the Treasury)	30

**7. Develop Purchasing Instrument.** The traditional purchasing instrument used by the State of Tennessee for major IT projects is the Request for Proposal (RFP), though other instruments are available if it is shown that the use of an RFP restricts competition, complicates the State's ability to obtain the "best value" solution for the State, or provides certain potential vendors with an unfair advantage. Considering the magnitude of this project and its anticipated "high dollar" cost, it is recommended that the State utilize its most conservative purchasing instrument, the Request for Proposal, as its solicitation document for this procurement effort. The RFP should be developed in accordance with the RFP Instructions and Model Language template developed by F&A's Office of Contract Review.

Based on our research and input from the ERP Work Group, F&A's Office of Contract Review, and Comptroller of the Treasury representatives, it is recommended that the RFP be constructed as follows:

- ◆ A single RFP will be issued for software and implementation services. The "single RFP" approach provides the following benefits:
  - The Evaluation Committee is able to observe and evaluate how responsive the prime contractor and its subcontractors are as a team to meeting the State's needs;
  - Any potential resulting contract will link the vendors' collective performance to project success;
  - It is easier to envision the "complete picture" – nothing "slips by"; and
  - This approach enhances accountability and minimizes "finger pointing".
- ◆ Should multiple vendors be involved in a proposed solution, one and only one vendor will function as the prime contractor. The State will not designate whether the software or implementation services vendor must function as the prime contractor.
- ◆ Subcontractors will only be allowed to participate in one proposal. This will eliminate the State obtaining and having to evaluate multiple implementation proposals for a single software product. The RFP will include a process whereby subcontractors will be required to certify that they are only participating in a single vendor proposal. An exception will need to be made to allow third party software providers to be included in multiple proposals as some third party software is commonly utilized by multiple ERP software offerings (e.g., ad hoc reporting software such as Crystal Reports and payroll tax calculation software such as BSI) and cannot be restricted to a single proposal offering.
- ◆ The prime contractor will be responsible for all third party software proposed.
- ◆ All software proposed should have a proven track record and be supported by comparable references in the public sector.
- ◆ Implementation services will be provided under a fixed-price arrangement. Areas with an undefined scope or other complications that prohibit inclusion under the fixed price shall be addressed through a "not-to-exceed" arrangement.

Additionally, fixed billing rates by type of service and skill level will be obtained to address a limited amount or limited percentage of out-of-scope tasks that arise during the project life cycle. The limited “out-of-scope” component of the evaluation process will be part of each vendor’s competitive bid. As such, each potential vendor will be required to submit fixed billing rates for specific types of service and skill levels identified in the RFP, and a standard number of hours will be applied to each vendors cost proposal as part of the total cost evaluation.

- ◆ All vendor payments will be based on the completion and State acceptance of major deliverables or achievement of major project milestones. A 15% retainage will be withheld and will not be released until the software has been accepted by the State and the initial three-month post-implementation support period has expired.
- ◆ Even though the State will procure the hardware components, potential vendors will be required to provide hardware requirements (client and server) in their proposals (taking into account the State’s current technical environment) that will achieve system performance as detailed in the RFP (i.e., response time) and is most cost-effective for the State. Cost effectiveness should include annual operating costs.
- ◆ Potential vendors will be required to identify the relational database management system (RDBMS) proposed to support the ERP application software.
- ◆ Potential vendors will be required to submit a recommended plan for allocating system costs to state agencies.
- ◆ Potential vendors will be required to document the specifics of their software release plan, including:
  - History of software releases and planned future releases;
  - The time period over which the proposed ERP software release will be supported;
  - The State’s obligations following issuance of a new release; and
  - How long maintenance will be continued for the prior release.
- ◆ All proposals submitted will require a signature of the party authorized to legally bind the proposer as well as the proposer’s legal counsel to certify compliance with the State’s terms and conditions.

The RFP should be developed in accordance with the agreed-upon procurement strategy. Care should be taken in preparing the required RFP response format to facilitate a proper “apples-to-apples” comparison of responses.

We recommend that the RFP adhere to the services contracting standards per the F&A Office of Contract Review. The contents may include, but not be limited to, the following:

- ◆ Introduction (background, purpose, scope per final scoping decisions made in Task 1);

- ◆ RFP schedule of events
- ◆ General requirements and Information;
- ◆ Special requirements;
- ◆ Proposal format and content;
- ◆ Evaluation and contract award information;
- ◆ Standard contract information (terms and conditions);
- ◆ Pro forma contract;
- ◆ Pre-proposal conference information;
- ◆ Documentation of existing State administrative systems (including usage metrics);
- ◆ Documentation of State resources available to work on the project;
- ◆ Documentation of facilities and equipment to be provided by the State;
- ◆ Functional requirements (in matrix format);
- ◆ Technical requirements;
- ◆ Interfacing system requirements;
- ◆ Vendor qualifications and experience;
- ◆ Implementation and post-implementation services to be provided; and
- ◆ Cost (to be submitted separately).

Based on the results of this study, it is recommended that the RFP and associated functional requirements address the following functional areas though the functional scope will ultimately be based on decisions made during the Final Project Scoping session(s) in Task 1 above.

- ◆ Financial Management
  - General Ledger / Budget Control
  - Accounts Payable / Travel
  - Accounts Receivable / Cash Receipts / Cash Management
  - Budget Development (including Performance-Based Budgeting)
  - Cost Accounting / Allocation
  - Project Management and Grant Accounting
  - Purchasing
  - eProcurement
    - Catalog Procurement
    - Solicitations (eRFx)
    - Reverse Auctions

- Vendor Registration
- Inventory
- Asset Management
- ◆ Human Resources
  - Employee Self-Service
  - Personnel Administration
  - Payroll Administration
  - Position Control
  - Recruitment and Applicant Tracking
  - Training and Employee Development
  - Compensation
  - Time Reporting
  - Employee Leave Accounting
  - Benefits Administration (insurance only)

Based on the results of the Vendor Comparison Analysis, it is recommended that the State closely examine how to address Fleet Management and DOT-specific Project Accounting and Materials Management requirements. The factors that should be examined are:

- ◆ Awarded ERP vendor's software functionality and future software release plans;
- ◆ Cost, impact and risks associated with potential modifications required to meet these system requirements;
- ◆ Functionality and cost of third party software;
- ◆ Feasibility of potential work-arounds;
- ◆ Priority of functionality; and
- ◆ Level of effort required to integrate third party software products.

After these factors are appropriately weighed, the State may decide whether to include or exclude Fleet Management and TDOT-specific Project Accounting and Materials Management functionality in the project.

It is recommended that the RFP address the following types of implementation services:

- ◆ Project management;
- ◆ Infrastructure set-up and testing;
- ◆ Software configuration and business process re-engineering;
- ◆ Change management;
- ◆ Training and user documentation;

- ◆ eProcurement-specific services:
  - Vendor registration and enablement,
  - Electronic catalog assistance, and
  - Strategic sourcing;
- ◆ Custom development:
  - Interface development,
  - Enhancements and modifications,
  - Report development, and
  - Workflow configuration; and
- ◆ Data conversion and loading.

The State should also obtain optional pricing and service information associated with application hosting solutions. Numerous hosting models exist today, but the most common model involves the client paying a subscription fee for use of ERP software that is maintained by the Application Service Provider (ASP). The ASP provides the technical infrastructure and support services to the client organization.

Potential benefits of an ASP solution to the State include:

- ◆ Expected cost savings (brief history has shown varied actual results);
- ◆ Reduced need to hire and retain highly skilled (and expensive) technical resources;
- ◆ Continued very high levels of “uptime” and maintenance that is seamless to the user;
- ◆ Improved levels of customer service (brief history has shown varied actual results);
- ◆ Reduced need to purchase new, rapidly depreciating hardware and software;
- ◆ Reduced initial investment and “pay-as-you-go” financing;
- ◆ Predictability of cash flow; and
- ◆ Possible decreased cost of ownership.

Potential risks of an ASP solution to the State include:

- ◆ Negotiations typically involve multi-year “lock-in” contracts, which raise concerns of vendor stability (GartnerGroup analysts estimate that 60% of the ASPs in business today will fail in the near future) and quality of service;
- ◆ On multi-year contracts, vendor profits are often “backend loaded” into the later years of the contract, so that attractive first year pricing may be misleading;

- ◆ As needs and business grow, organizations see their use of computer services increase over the years, and vendor billings increase accordingly; however, additional work typically is priced higher than the initial services, so that anticipated cost savings may not materialize;
- ◆ Data control and security (privacy);
- ◆ Political risk (State IT jobs may go away); and
- ◆ Where hosting has failed to be cost-effective or does not yield satisfactory service delivery, the organizations involved have struggled to reinstate in-house IT functions without impacting services.

Upon completion of the final draft, the RFP should be reviewed with the State's Legal Counsel, Project Sponsors, and Evaluation Committee, for the purpose of obtaining and incorporating their comments into the final RFP. The RFP must then be reviewed for approval by F&A's Office of Contract Review and the Comptroller of the Treasury prior to distribution to potential vendors.

Several key decisions must be made by the Project Sponsors and members of the ERP Work Group before the State can issue the RFP. These required decisions include:

- ◆ What levels and number of resources will the State provide?
- ◆ Will the State backfill key positions?
- ◆ What facilities and equipment will the State provide?
- ◆ How will the project be funded?
- ◆ Will the State mandate the hardware and database requirements and standards to be complied with?

- 8. Issue RFP to Potential Vendors and Support Proposal Process.** The RFP will be distributed to the "known" ERP software vendors and software integration/implementation firms. Additionally, the RFP will be posted for access by other potential vendors in accordance with the State's existing best practices. The five (5) vendors that responded to the Request for Information (RFI) associated with this study (AMS, Lawson, Oracle, PeopleSoft, and SAP) will be included in the distribution list.

Additional activities to be completed include:

- ◆ Conducting a pre-proposal conference for potential vendors; and
- ◆ Answering potential vendor questions in accordance with RFP instructions.

- 9. Conduct Evaluation Process.** This task will involve executing the evaluation activities as documented in the Evaluation Guide. Specific activities to be completed include:

- ◆ Evaluating vendor proposals and preparing points for vendors to clarify;
- ◆ Preparing detailed cost analyses;
- ◆ Conducting and evaluating vendor presentations/software demonstrations;

- ◆ Preparing a fit/gap analysis that summarizes how each vendor proposal addresses the requirements specified in the RFP and the gaps as identified in their response and their presentation/demonstration; and
- ◆ Conducting reference checks.

Each proposal submitted for evaluation will be scored as follows:

#### ***Administrative Compliance***

An administrative compliance will be conducted on all proposals to ensure they meet mandatory proposal submission requirements as documented in the RFP. A proposal must meet these requirements in order to receive further consideration. The Procurement Facilitator will conduct the Administrative Compliance Evaluation. All Offers will be reviewed for compliance with these requirements and accepted into the next phase or rejected from further consideration.

The Administrative Compliance Review is performed using a checklist that lists each administrative compliance requirement that must be met. Some examples of requirements that may be included in this review are:

- ◆ Submission by the specified due date and time,
- ◆ Separately bound technical and cost proposals,
- ◆ Requested number of hard-copies and electronic copies received, and
- ◆ Submission of all required forms in accordance with RFP instructions.

Any Offer rejected for failure to meet the required submission date and time will be immediately returned unopened to the proposed vendor.

#### ***Review of Technical Proposal***

The Evaluation Committee will evaluate all proposals that pass the Administrative Compliance Review. The Evaluation Committee will study the vendor proposals and provide scores for “General Proposer Qualifications and Experience” and “Technical Approach” as follows:

CATEGORIES				MAXIMUM POINTS POSSIBLE
General	Proposer	Qualifications	and	30
Experience				
Technical Approach				20

#### ***Vendor Presentation and Software Demonstration***

Once the Technical Review has been completed, each potential vendor will be required to participate in a Vendor Presentation and Software Demonstration. The purpose of the product demonstrations is to allow the potential vendors to demonstrate the functionality of their software using scripts developed by the State,

and to allow the Evaluation Committee the opportunity to better understand the information in each proposal.

The Procurement Facilitator will provide an agenda and demonstration script on a staggered basis, in accordance with the schedule, to allow each potential vendor an equal number of days of preparation prior to the first day of its scheduled demonstration. The demonstration scripts will have been prepared prior to the evaluation process. The agenda and demonstration scripts will be identical for all potential vendors. In order to ensure a fair and complete evaluation process, each Evaluation Committee member must attend all vendor demonstration sessions.

The use of a comprehensive set of demonstration scripts during the Vendor Presentation and Software Demonstration is a critical component of the software evaluation process. Such scripts require the software vendors to focus on demonstrating if and how their products meet specific State business requirements instead of demonstrating features that have little to do with meeting the State's business requirements. The demonstration scripts should focus on specific State business needs and often require a 3 to 4 day time commitment per potential vendor to complete for full ERP functionality.

Once the Vendor Presentation and Software Demonstrations have been completed, the Evaluation Committee should provide scores as follows:

CATEGORIES	MAXIMUM POINTS POSSIBLE
Vendor Presentation and Software Demonstration (including compliance with functional and technical system requirements)	20

In determining the scores for the Vendor Presentation and Software Demonstration, Evaluation Committee members should also take in account vendor compliance with the functional and technical system requirements as documented in their responses to the requirements matrices.

### **Cost Proposal**

At this time, the separately bound cost proposals should be thoroughly reviewed to ensure that all cost requirements were addressed. This analysis is typically performed by a qualified resource that is not part of the Evaluation Committee. In accordance with F&A's Office of Contract Review standards, the following formula will be used to determine the points that a potential vendor receives for the Cost Proposal:

$$\frac{\text{lowest proposed cost for evaluation}}{\text{proposed cost for evaluation being evaluated}} \times \frac{\text{maximum cost}}{\text{points}} = \frac{\text{score of cost}}{\text{proposal being evaluated}}$$

A minimum of thirty (30) points is required by F&A's Office of Contract Review and the Comptroller of the Treasury.

CATEGORIES	MAXIMUM POINTS POSSIBLE
Cost	30

### ***Notice of Intent to Award***

At this time, a Notice of Intent to Award is prepared based on the completed scores of the Evaluation Committee.

**10. Contract Negotiations.** The State reserves the right, at its sole discretion, to negotiate with the apparent best-evaluated Proposer subsequent to the Notice of Intent to Award. The best evaluated Proposer must be prepared to enter into a contract with the State which will be substantially the same as the pro forma contract included in the RFP. Notwithstanding, the State reserves the right to add terms and conditions, deemed to be in the best interest of the State, during final contract negotiations. Any such terms and conditions must be within the scope of the RFP and must not affect the basis of proposal evaluations. Any communication, clarification, or negotiation must be conducted in a manner so as not to provide the best evaluated Proposer with an unfair advantage over other Proposers in the competitive procurement process.

### **POTENTIAL CHALLENGES AND CONCERNS**

Following are some potential challenges and concerns associated with the acquisition of ERP software and implementation services that must be addressed:

- ♦ **Limitation of Liability.** There have been concerns from the ERP Work Group and the vendor community regarding the State's inability to limit contractor liability in the performance of services. In the past, this has limited vendor participation in response to large information technology procurements. However, State law now allows the Department of Finance and Administration to authorize limitations of contractor liability for information technology services. In recent years, the Department has been allowed to limit contractor liability to two (2) times the value of the contract if failure to limit vendor liability will detrimentally impact the fairness of the procurement, and/or the State's interest from a competitive procurement standpoint.

Rules of the Department of Finance and Administration, Chapter 0620-3-7, Limitations of Liability in State Services, set out the approval process that must be followed to request such limitations, including timeliness of the request. The request to use a limitation of liability must be submitted under the signature of the procuring agency commissioner or chief executive and must contain justification that addresses the following:

- The text of the limitation of liability sought to be used;

- The risks of liability to the State created by the information technology services purchased under the contract, and the impact on the State by allowing a limitation;
  - The conditions in the market which justify a limitation of liability;
  - The anticipated impact on the State's procurement if limitation of liability is not allowed; and,
  - The identification of one or more persons in the procuring agency familiar with the information set forth in the request to permit a limitation of liability.
- ♦ **Threat of Protests from Unsuccessful Vendors.** The State can best address these threats by establishing and complying with a thorough and well-documented formal evaluation process. Not releasing evaluation results until an award has been made also helps to minimize delays associated with threatened protests.
- ♦ **Inability of State to Meet Staffing Requirements.** As part of the procurement process, the State will need to document the level of effort and skill sets it intends to provide for the ERP implementation project. History has shown that governments often do not meet their commitments to provide dedicated project team members on a full-time basis as documented in the RFP. And often times when the State did meet its commitments from a "numbers" standpoint, it failed to provide the skill levels needed (e.g., user agencies sometimes volunteer less-productive staff instead of their best performers out of fear that they may never return). This situation makes it difficult to enforce vendor commitments as defined in the Statement of Work. The ERP Work Group needs to commit to recruiting the best and brightest resources to the project team and plan to provide incentives for keeping them. The user agencies need to fully understand the commitment being made and that some resources may be asked to stay as part of the ongoing support organization, but also understand the time of ongoing support that is to be provided.
- ♦ **Change Management Effort Underestimated or Not Considered a Priority.** When an organization implements an ERP system, the greatest risk to success does not arise from the software configuration and implementation process, but from the changes to the existing workplace. The new system will utilize new business processes that may radically change the work environment and job tasks of employees. The risks associated with not recognizing the change impact and properly managing it can disrupt the project implementation effort and system acceptance, decrease employee productivity, and increase employee stress and anxiety. It is recommended that the State endorse a comprehensive change management program. Resources should be committed to the change management function on a full-time basis. Expertise should be obtained from the implementation vendor or another firm that specializes in change management services if adequate resources are not available within the State.
- ♦ **Inability to Hold Vendor Accountable for Project Success.** The major reasons that ERP projects are unable to hold the vendor accountable for project success typically involve the usage of a "time and materials" payment plan and/or the State fails to meet its commitments to the project (e.g., failure to provide State subject matter experts, failure to resolve issues on a timely basis). To help alleviate this concern, all vendor payments

should be based on the completion and State acceptance of major deliverables or achievement of major project milestones. At least 15% retainage will be withheld and will not be released until the software has been accepted by the State and the initial 3-month post-implementation support period has expired.

- ◆ **ERP Software Fails to Meet Business Needs.** To eliminate this concern, the awarded vendor's response to the functional matrices are included in the final contract. The requirements are then monitored on an ongoing basis to ensure that the system is designed and configured to meet the State's business requirements. As part of acceptance testing, the system must properly meet each requirement as documented in the functional matrices.

## FUNDING OPTIONS / PRIORITIES

A scenario for funding an ERP system could be composed of one or a variety of funding sources within the State. Documented below are some of the potential funding sources to be considered along with a brief discussion of each.

Projected funding amounts and timing are based on estimated needs as outlined in the ERP Cost/Benefit Analysis (CBA) – see the *Cost/Benefit Analysis* section of the report along with the supporting material in *Appendix G*. A typical 'large' information technology project in Tennessee includes costs that cover management, personnel, software, hardware, documentation, data conversion, and training for all phases of development. The Cost/Benefit Analysis also outlines the costs to operate and maintain the new system, including any major hardware replacements during a 10-year timeframe. Costs are projected for this 10-year window in order to calculate any potential payback, return on investment, and to ensure that the State can fund the long-term costs of the productional system. Benefits are identified that are directly attributable to the successful implementation of a project.

The Cost / Benefit Analysis shows the costs by year for eleven (11) years.

- ◆ The first year (Year 0) of the ERP project would cover the letting of an RFP for the ERP software and implementation services.
- ◆ Years 1 through 4 bring all aspects of the project into production.
- ◆ Year 6 covers plans for a potential major upgrade of the ERP software.
- ◆ Years 1 through 6 are the years requiring the most funding.
- ◆ Years 7 and forward cover maintaining and operating the system.

Funding for a large technology project is estimated 2-3 years in advance and is refined annually as more information is known about the project. There are several funding sources for new Information Technology Projects in the State of Tennessee and combinations of these sources can be used to fund a project. These sources include:

1. **State Continuance** indicates that the money already exists in an agency's base budget. This is the first choice of funding for any project. For ERP, every agency already pays for core services. An assessment is made of each agency for operating core systems such as accounting (STARS), personnel (SEIS), asset management (POST), payroll (SEIS/CZAI), and insurance (TIS). It is assumed that this assessment would continue in order to fund operating costs associated with an ERP system implementation. These current assessments are included in the benefits section of the CBA, and will offset costs of the ERP system once it 'goes live'. State Continuance will be considered as an ERP funding source.
2. The **Systems Development Fund (SDF)** is a pool set aside for funding large application development projects. An agency requests use of this pool, and depending on the availability of funds within the SDF, the project is allocated funds to be used during the life of the project's development phase. The State agency repays these funds over a period of 3-4 years. The Information Systems Council authorizes

expenditures from this fund based on the recommendation of the Commissioner of F & A. Within the SDF, hardware expenditures are kept separate from application development.

- ◆ **Application Development (SDF-A):** SDF-A dollars are used for information systems application costs. No general administrative fee or overhead charge is applied to funds borrowed from SDF-A for applications. Repayment of SDF funds for applications normally begins the year the application goes into production and is repaid in no more than 5 years. SDF-A dollars will be considered as an ERP funding source.
  - ◆ **Hardware (SDF-H):** SDF-H dollars are used to purchase equipment and non-application system software. No operational costs can be applied to funds borrowed from SDF-H. For planning purposes, an estimated 10% should be applied to the cost of borrowing SDF funds for hardware purchases. This cost should be shown as a separate item on the Operational Cost Assessment worksheet under the cost category “General Administrative Fee (SDF).” SDF loans for hardware purchases are usually set up for a 5-year / 60-month payback. Repayment typically begins the year in which the purchase is made. SDF-H dollars will be considered as an ERP funding source.
3. **State Improvement** is a funding source that an agency would request in their budget prior to the fiscal year in which it is needed. Both F&A and Legislative approval is required. A State Improvement can be a one-time or recurring request to the Legislature for short-term dollars to fund a major information technology project. In years of tight budgets, improvements are difficult to obtain. Any Improvement dollar request will be used minimally as an ERP funding source.
  4. **Federal** dollars are funds the Federal government has approved or is expected to approve for specific projects. It is unlikely that any direct Federal funds are directly available for funding the ERP Project.
  5. **Other** is a funding source that comes from a variety of areas. Examples include special fees, taxes set aside specifically for information systems projects, license sales, and usage fees. It is unlikely that any ‘Other’ funds are directly available for funding the ERP Project.
  6. **Bonds** are interest-bearing certificates used to finance projects such as building construction or major purchases of system hardware. Typically, bonds are used to finance building construction or to purchase items that are considered tangible assets and are not used to purchase software. If this category of funding is to be considered among the funding mix for ERP, further discussion is needed to consider the implications of using bonds for software. The Information Systems Council would approve the use of bonds for the ERP Project. Repayment of any bonds would be included in the CBA’s Financial Summary. Bonds will be considered as an ERP funding source.
  7. **Vendor Financing** implies that the successful ERP vendor could finance the purchase of the software over an agreed-upon number of years. One advantage of vendor financing is that it would help to ‘level’ the amount to be paid. The costs for the ERP Project increase or ‘spike’ in years 2 through 6, and then become more

consistent during maintenance years. The other categories of funding options function best for consistent multi-year needs and were not designed to cover multi-year 'spikes'. This funding option will require more research to ensure that it is a viable option for the State. The potential downside of this option is that the cost of financing would most likely be higher than other State financing options. Vendor financing will be considered as an ERP funding source.

## RECOMMENDED DEPLOYMENT STRATEGY

When an ERP system is fully installed, all functionality will be “live” in all target organizations. The purpose of this document is to explore deployment alternatives and recommend an ERP deployment strategy for the State of Tennessee.

There are a number of methods by which an ERP system can be deployed throughout the State. These methods, which can be referred to as “big bang” or “phased”, are distinguished by how the organization and functionality are addressed for each of the deployment methods.

When all software functionality is deployed across the entire organization at one time, this is known as a “big bang” implementation. The benefit of a “big bang” implementation is that the software is installed more quickly than under other deployment strategies. Therefore, the implementation consultant costs, as well as other costs, are minimized. With the “big bang” approach, cost of developing temporary interfaces can be avoided. Furthermore, legacy systems can be retired earlier resulting in reduced costs. However, there is a greater risk with the “big bang” approach, as the organization may not be able to quickly absorb all of the changes associated with this approach. This approach also presents a tremendous training challenge.

Software can also be deployed in a phased manner across the organization. When a phased implementation approach is used, agencies and software modules are typically grouped in accordance with the abilities of the project team to support each phase. With this approach, there is an increased ability to absorb change and therefore decrease project risk. In addition, training is more manageable. The shortcoming of the phased approach is that it is usually considerably more expensive than a “big bang” approach, as the total project duration is typically longer than a “big bang” approach. Additional cost factors associated with this approach include the cost of developing temporary interfaces and the cost of legacy systems that remain in production for a longer period of time.

The table below summarizes the pro’s and con’s of the implementation approaches:

IMPLEMENTATION APPROACH	PRO	CON
“Big Bang”	<ul style="list-style-type: none"><li>• Reduced implementation cost due to reduced project duration</li><li>• Avoided cost of developing temporary interfaces</li><li>• Legacy systems can be retired earlier and therefore reduce costs.</li></ul>	<ul style="list-style-type: none"><li>• Decreased time period to absorb change</li><li>• Difficult to adequately train all staff “just in time”</li></ul>

IMPLEMENTATION APPROACH	PRO	CON
Phase Organization/Software	<ul style="list-style-type: none"> <li>Increased ability to absorb change and therefore decreased project risk</li> <li>Fewer users to train for a successful go-live</li> </ul>	<ul style="list-style-type: none"> <li>Increased implementation cost and project duration</li> <li>Cost of developing temporary interfaces</li> <li>Legacy systems are retired later and therefore more costs are incurred</li> </ul>

When software functionality is deployed in a phased manner, the functionality is typically implemented in two broad functionality groupings: Human Resources/Payroll and Financials/Procurement. A few organizations have chosen to implement core ERP modules from one of those groupings first, followed by other modules at a future date. For example, Applicant Services and Training / Career Development may be implemented months or years after the core modules of HR/Payroll are implemented. Also, Inventory, Asset Management, Fleet Management and Billing may be implemented after the core Financials/Procurement modules are implemented. It is important, however, to minimize the “breaking” of the integration within the broad functionality groupings.

Typically, for a large organization, the “big bang” approach should be avoided. The risks and strain on the organization are too great. In most cases, large organizations implement the core financials, including General Ledger, Budgetary Control, Accounts Payable, Accounts Receivable, during the first phase or “wave,” since Financials are the backbone of an ERP system. However, there may be a compelling business case for considering other alternatives.

As recommended by other organizations, it is normally best for Financials to be deployed at the beginning of the fiscal year to avoid mid-year conversions. However, each organization must consider whether the complexity and cost of mid-year conversions outweigh the risk of bringing financials “live” for all organizations at one time.

While there are a number of implementation best practices, each organization must consider its own business priorities and complexities in selecting the appropriate deployment strategy. The State of Tennessee, must consider the unique requirements, of some state agencies, such as the Tennessee Department of Transportation, the Department of Children’s Services, and TennCare. For example, some agencies have unique funding or project management requirements. Please refer to the sub-section “Deployment Strategy Decision Factors” for an additional discussion of factors to consider before selecting a deployment strategy.

## DEPLOYMENT STRATEGIES OF OTHER STATES

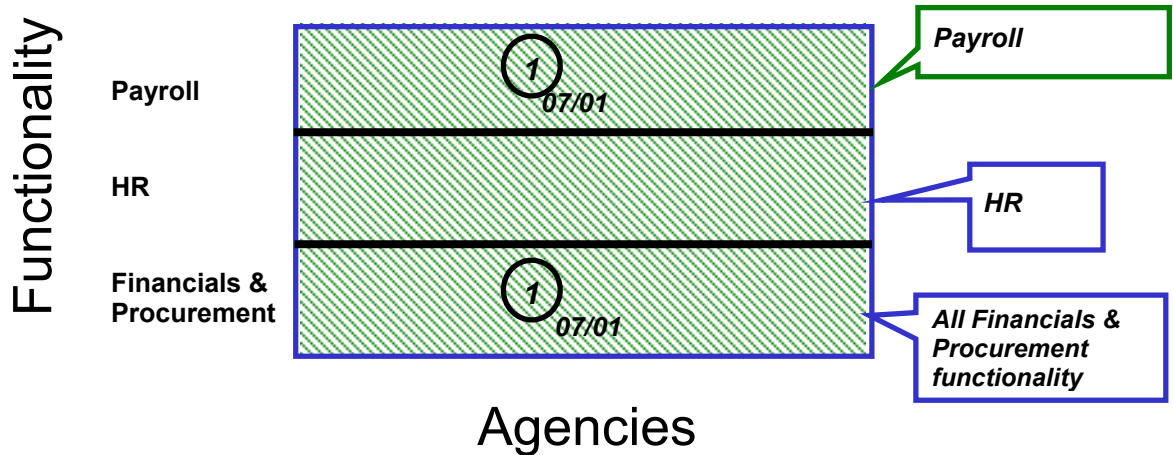
As a part of the ERP Automation Assessment Study, ten (10) states as well as the University of Tennessee, were surveyed to discuss their experiences with ERP. A portion of the study focused on how the entities chose to deploy their ERP system. A summary of the deployment strategies is provided on the next page and is followed by each entity's deployment experience.

Organization	Financials/ Procurement		HR/Payroll		Big Bang, HR or Financials First
	Organization Deployment	Functionality Deployment	Organization Deployment	Functionality Deployment	
State of Arkansas	All Organizations	All Functionality	All Organizations	All Functionality	Big Bang
State of Connecticut	All Organizations	Phased	All Organizations	Phased	Financials
State of Georgia	All Organizations	All Functionality	All Organizations	All Functionality	Financials
State of Louisiana	N/A	N/A	All Organizations	Phased	HR/Payroll
State of Missouri	All Organizations	All Functionality	Phased	All Functionality	Financials
State of Montana	All Organizations	Phased	All Organizations	All Functionality	HR/Payroll
State of Nevada	Phased	All Functionality	Phased	All Functionality	
State of Pennsylvania	Phased	All Functionality	Big Bang	Phased	Financials
University of TN	All Organizations	All Functionality	All Organizations	All Functionality	Big Bang
State of Utah	N/A	N/A	All Organizations	All Functionality	HR/Payroll

Only the State of Arkansas and the University of Tennessee performed a true “big bang” deployment. The remainder of the entities successfully implemented the software using a variety of deployment strategies as depicted in the diagrams that follow.

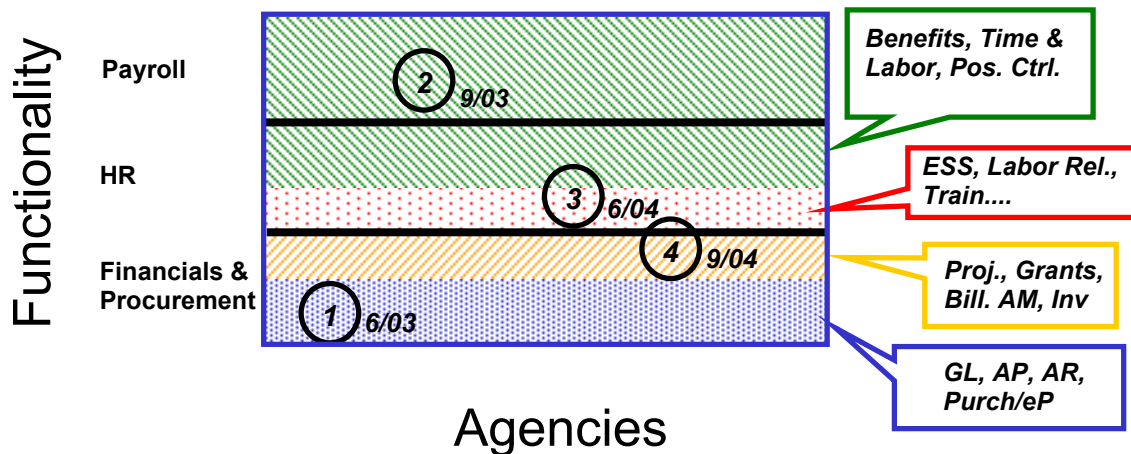
The State of Arkansas utilized a “big bang” approach and implemented all HR/Payroll, Financial, and Procurement functionality across all agencies on July 1, 2001.

## State of Arkansas

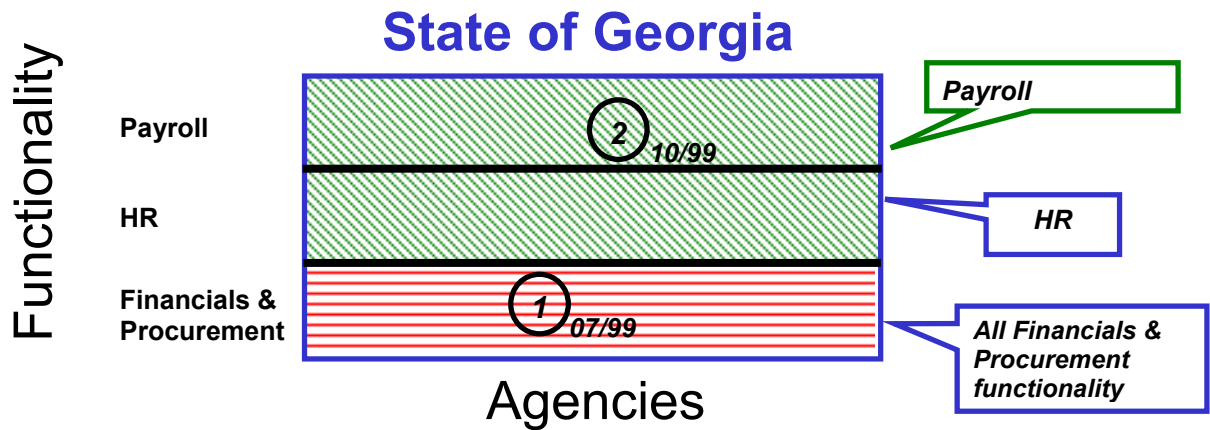


The State of Connecticut has selected a phase deployment approach. In their approach, the software has been broken into four components. Financials and Procurement will be implemented across all agencies in June 2003. These components will be followed by Payroll and most Human Resource functions in September 2003. The “Extended Human Resource” functions will be deployed in June of 2004. Lastly, “Extended Financials” (projects, grants, billing, asset management, and inventory) will be deployed in September 2004.

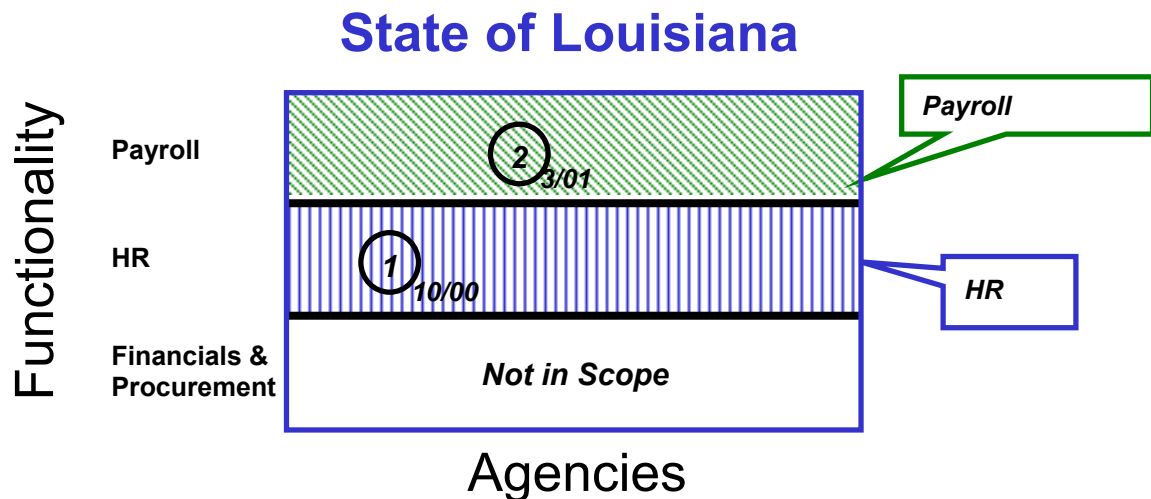
## State of Connecticut



The State of Georgia utilized a phased deployment approach. Financials and Procurement were implemented in July 1999. HR/Payroll was deployed in October 1999.

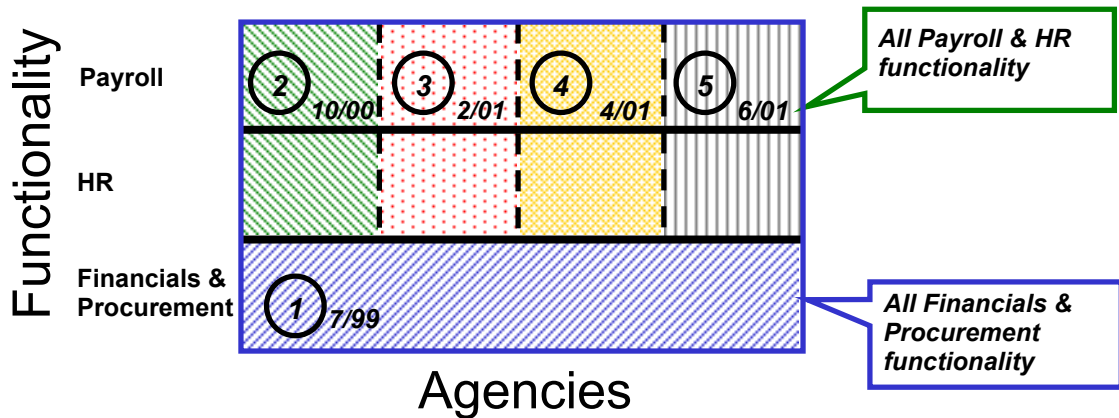


For the State of Louisiana, all HR functionality was deployed in October 2000. Payroll functionality was deployed at all agencies in March 2001. Financials and Procurement were not in the scope of their project. The State of Louisiana is in the process of acquiring financial and procurement implementation services.



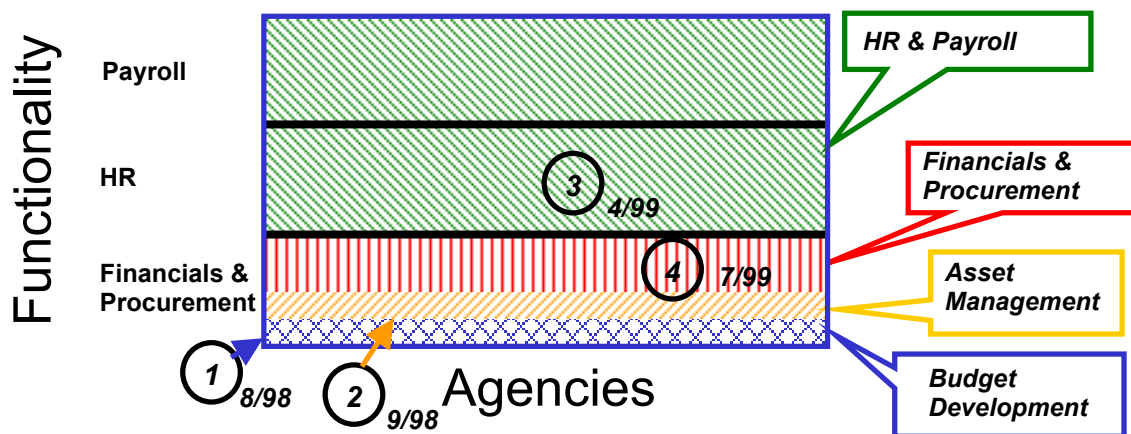
The State of Missouri deployed all functionality for Financials and Procurement at all agencies in July 1999. HR and Payroll were deployed to state agencies in four phases: October 2000; February 2001; April 2001; and June 2001.

## State of Missouri

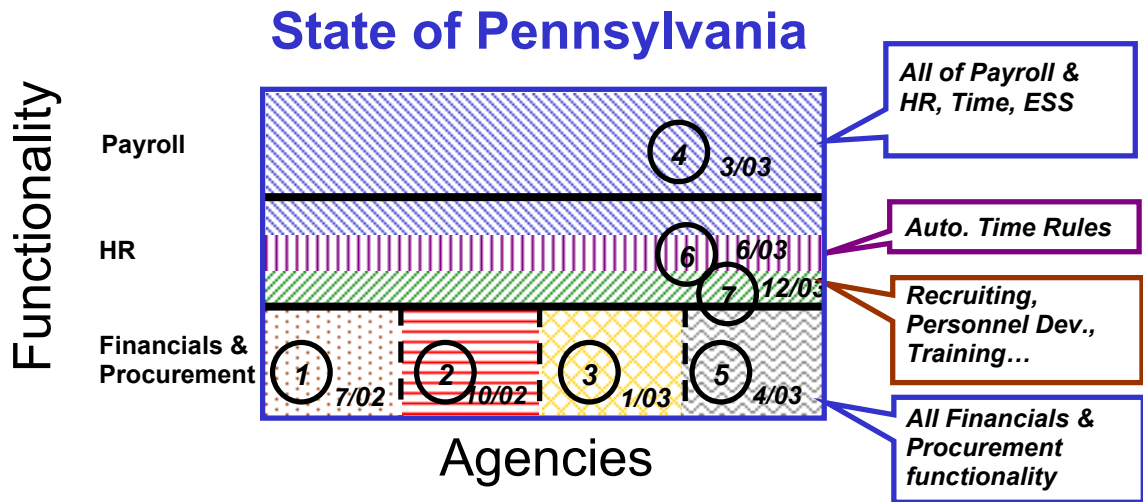


The State of Montana deployed Budget Development at all agencies in August 1998. Asset Management was rolled out to all agencies in September 1998, while HR/Payroll were implemented at all state agencies in April 1999. The remaining financial and procurement modules were deployed at all state agencies in July 1999.

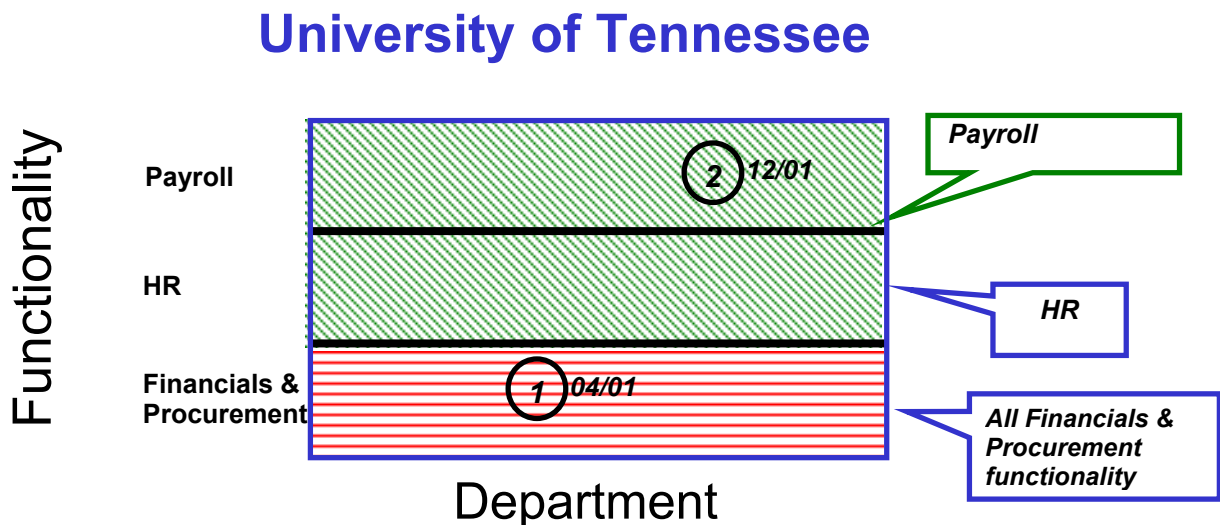
## State of Montana



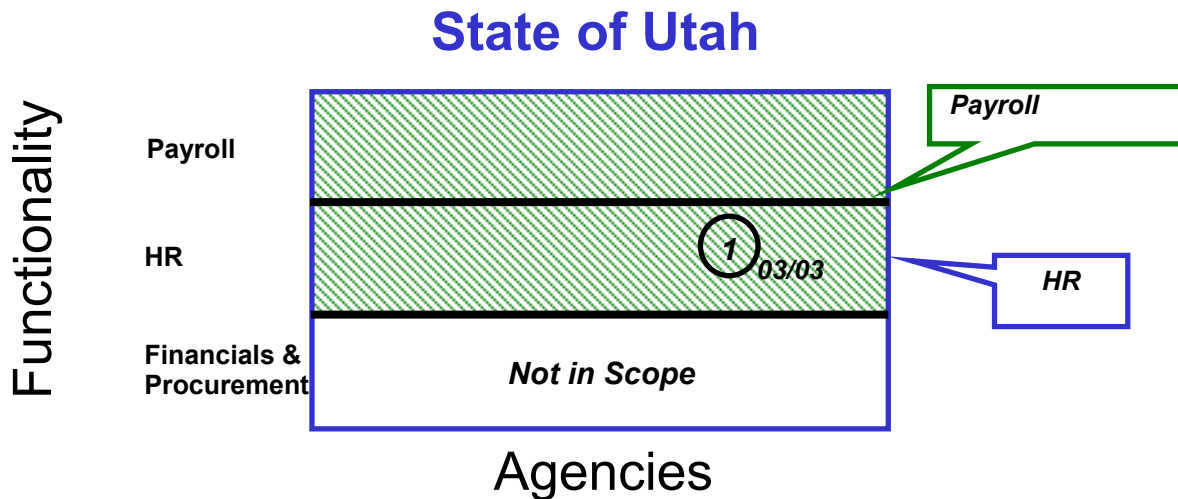
The State of Pennsylvania deployed Financials and Procurement in agency groupings in July 2002, October 2002, January 2003, and April 2003. All Payroll functionality plus HR, Time, and Employee Self-Service were scheduled to be deployed in March 2003. Automated time rules will follow in June 2003 and lastly Recruiting, Personnel Development, and Training will be implemented in December 2003.



The University of Tennessee deployed Financials and Procurement in all departments in April 2001. HR and Payroll functionality was deployed in all departments on December 2001.



The State of Utah is scheduled to deploy HR and Payroll functionality at all state agencies in September 2003. Financials and Procurement were not in the scope of their project.



#### **DEPLOYMENT STRATEGY DECISION FACTORS**

Each organization should consider a number of factors before selecting a deployment strategy for HR/Payroll and Financials/Procurement functionality. Those factors include the following:

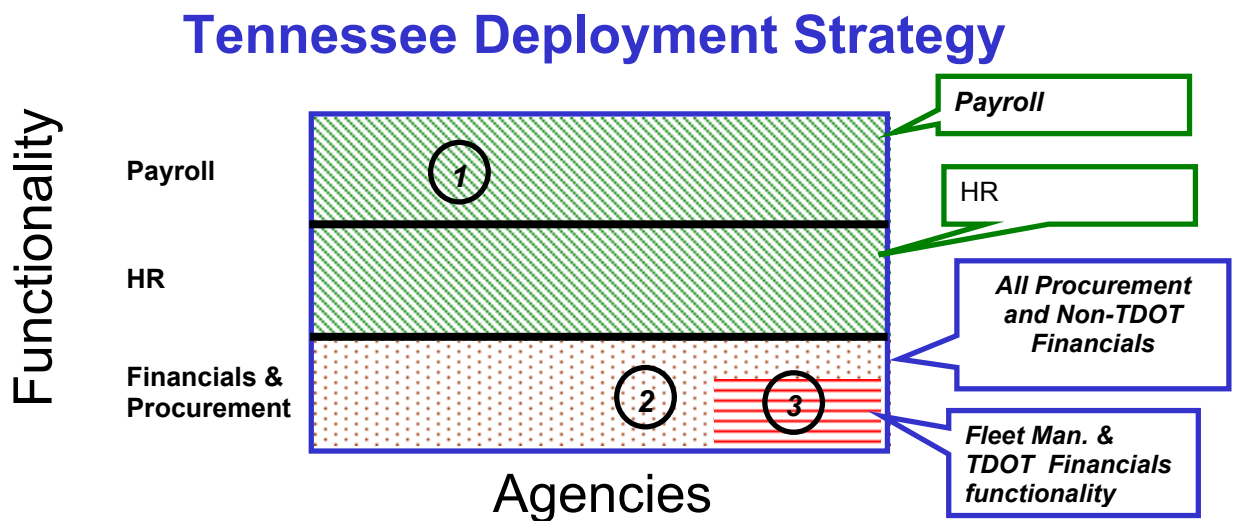
- ◆ Value Proposition – Does a portion of functionality offer a greater financial or service benefit than another?
- ◆ Risk Avoidance – Is there risk associated with implementing or not implementing a portion of the functionality?
- ◆ Mandate – Is there an executive, legislative or federal mandate that requires a portion of functionality on a specified date?
- ◆ Strategic Initiative – Does the functionality support an on-going or new business program?
- ◆ Funding Availability – Is funding available to support the functionality?
- ◆ Organizational Readiness – Has any part of the organization demonstrated a greater ability to accept change?
- ◆ Sponsorship – Have the senior executives identified a preference for a specific functionality that is more important?

Each of these factors have been analyzed and weighed for the State of Tennessee. No distinguishing factors were found for the Value Proposition, Mandate, Strategic Initiative, Funding Availability or Organizational Readiness factors. However, the Risk Avoidance and Sponsorship factors are in favor of HR/Payroll.

The risk factors associated with the current HR/Payroll system are as follows:

- ◆ The current HR/Payroll system is over 30 years old and difficult to maintain.
- ◆ Compensation and personnel policy changes often require program coding to implement necessary changes, due to the lack of system flexibility.
- ◆ Few State staff are trained to maintain the current system. In addition, those who currently maintain that system are very senior, leaving the State vulnerable to resignations and retirements.
- ◆ Maintenance of the existing underlying technology is likely to be discontinued.

Based upon the discussions with the Work Group, the experience of STA and the information obtained from surveys, the recommendation is that the State of Tennessee deploy an ERP system in the same manner as discussed in the RFI (see diagram below).



- ◆ **Phase 1**  
Human Resources, Payroll Administration, and Benefits Administration functionality should be implemented at all state agencies, at one time (implementation period not to exceed twenty-four [24] months). Administration of insurance benefits will be implemented at this time for Higher Education, the Board of Regents, Local Education, Local Government, and Tennessee Department of Transportation (TDOT).

◆ **Phase 2**

Financial Management, Budget Development, and Inventory functionality will be implemented for all agencies after Phase 1 is completed, over a period not to exceed eighteen (18) months. Procurement functionality, including eProcurement, will be also be implemented in this phase at all agencies including TDOT (assuming TDOT's functional needs can be met by the ERP system).

◆ **Phase 3**

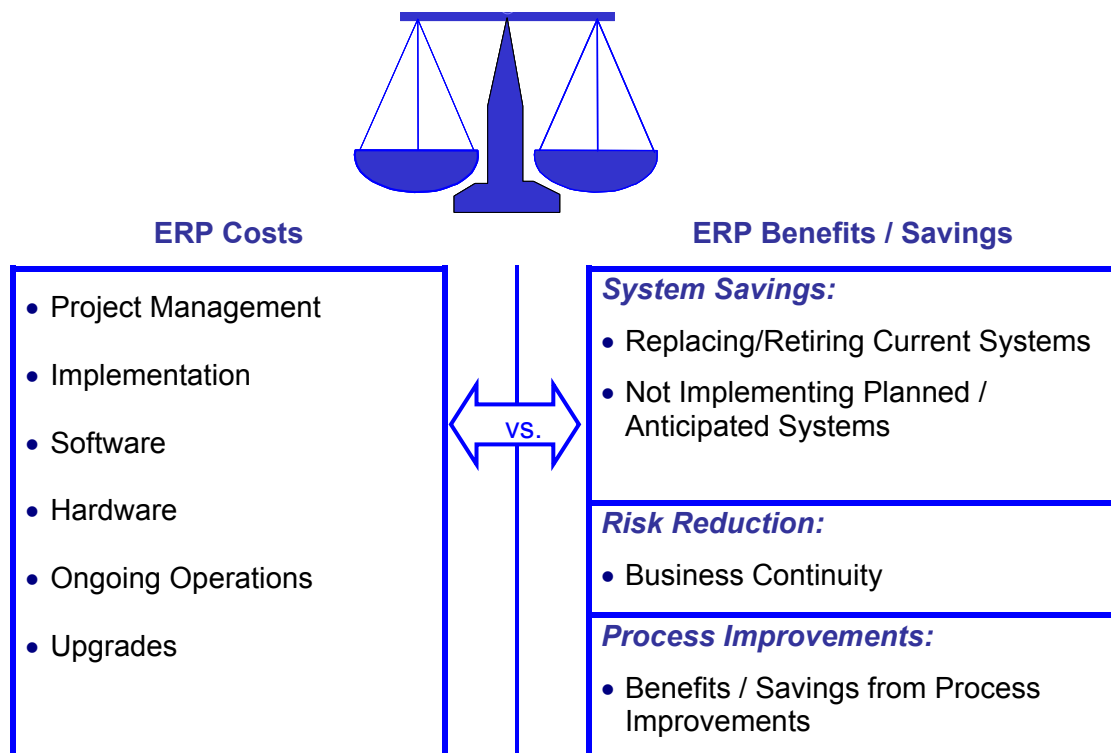
All Financial functionality will be implemented for TDOT (assuming TDOT's functional needs can be met by the ERP system) over a period not to exceed eighteen (18) months. Fleet Management functionality will be implemented at TDOT and the Department of Safety during this phase.

This deployment strategy will be confirmed after selecting the ERP vendor. Focus will be given to Benefits Administration and TDOT requirements to confirm that the selected ERP vendor can meet these business needs.

## COST / BENEFIT ANALYSIS

### BACKGROUND AND OBJECTIVES

The Cost Benefit Analysis (CBA) evaluates the estimated cost of implementing and maintaining a statewide ERP system vs. the potential benefits/savings from such an implementation, including: (1) retiring current systems and avoiding the implementation of planned/anticipated systems, (2) reducing business risk, and (3) realizing benefits/savings from process improvements.



Each of the three dollar-quantifiable components of the analysis depicted in the diagram above (represented by three of the boxes: ERP Costs, System Savings, Process Improvements) is discussed in the *Approach and Key Findings* section below.

The CBA was conducted for an 11-year planning period and was based on the following assumptions regarding the timing of the initiative:

◆ **Project Preparation and ERP Acquisition**

Prior to the actual ERP implementation effort (Years 1 through 5), the CBA schedule contains a Year 0 (assumed to be fiscal year ending in 2004). During this time period, it is assumed that the State will move forward with procuring ERP software and associated implementation services (e.g., develop and issue a RFP, create a

formal vendor evaluation process, develop vendor demonstration scripts, etc.), and will perform certain activities that will help the State prepare for implementing an ERP system.

◆ **ERP Implementation**

It is assumed that the ERP system will be implemented over a five-year period in three phases:

• **Phase 1**

During this phase, human resources, payroll administration, and benefits administration functionality will be implemented at all State agencies over a period of 24 months (Years 1 and 2). Administration of insurance benefits will also be implemented during this phase for Higher Education and the Board of Regents, Local Education, and Local Government.

• **Phase 2**

Financial management, budget development, and inventory functionality will be implemented for all agencies except the Department of Transportation after Phase 1 is completed, over a period of 18 months (Year 3 through mid-Year 4). Procurement functionality, including eProcurement, will also be implemented for all agencies during this phase, including TDOT (assuming TDOT's functional needs can be met by the ERP system).

• **Phase 3**

All remaining functionality (financial management, budget development, and inventory) will be implemented for TDOT (assuming TDOT's functional needs can be met by the ERP system) over a period of 18 months (mid-Year 4 through Year 5). Fleet management functionality will also be implemented for TDOT and the Department of Safety during this phase.

◆ **System Upgrade**

It is assumed that a system upgrade will be performed in Year 6 of the planning period.

◆ **Ongoing Operations**

Ongoing operational activities will begin when Phase 1 goes live (at the end of Year 2) and continue through the remainder of the CBA planning period.

## **APPROACH AND KEY FINDINGS**

As mentioned previously, this section of the document addresses each of the three primary components of the CBA analysis:

◆ **ERP Costs**

Cost to acquire, implement, operate, and upgrade a statewide ERP system

◆ **ERP Benefits/Savings – System Savings**

Savings resulting from retiring/avoiding existing/planned systems

◆ **ERP Benefits/Savings – Process Improvements**

Savings from improving business processes in terms of reduced cost of process execution, as well as improved process outcomes

**ERP Costs**

The category includes cost estimates to acquire, implement, and maintain an ERP system over an 11-year period. The primary inputs to this section of the CBA were:

◆ **Responses to a Request for Information (RFI)**

An RFI was developed and issued on December 2, 2002 as part of the ERP Automation Assessment Study (refer to Appendix B for a copy of the RFI). The RFI requested cost estimates for the ERP software (including ongoing software maintenance fees) and services which would be required to (1) implement the software over a five-year period as described previously in this document, and (2) perform a software upgrade in Year 6 of the planning schedule.

Responses were received from the following five (5) ERP vendors:

- AMS
- Lawson
- Oracle
- PeopleSoft
- SAP

The responses from the above-listed vendors are maintained in the Office for Information Resources.

◆ **Interviews with Other States**

Interviews were conducted with several states that have implemented, or are in the process of implementing, an ERP system. The University of Tennessee, which has implemented SAP, was also interviewed. A summary of the information gathered during these interviews is contained in Appendix D of this report.

◆ **STA Analysis and Experience**

STA has considerable experience assisting public sector clients in evaluating, selecting, acquiring, and implementing ERP systems. In particular, STA consultants have extensive experience in estimating ERP implementation costs.

The 11-year estimate (Years 0-10), along with detailed assumptions regarding the estimate, is contained in Appendix G of this report. A summary schedule of the estimate is presented in the table below:

**Estimated ERP Costs**  
(\$ millions)

	Years											Total
	0	1	2	3	4	5	6	7	8	9	10	
<b>Implementation Costs</b>												
Consulting Fees	\$ 0.8	\$ 11.4	\$ 12.6	\$ 17.4	\$ 17.2	\$ 10.3	\$ 1.7	\$ -	\$ -	\$ -	\$ -	\$ 71.4
State Employees	1.1	1.7	3.3	2.6	3.4	1.6	0.3	-	-	-	-	14.0
ERP Software -- license	-	4.5	-	5.5	-	-	-	-	-	-	-	10.0
Facilities & Other	-	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	1.9
Total Cost of Implementation	1.9	17.9	16.2	25.9	20.9	12.2	2.2	-	-	-	-	97.2
<b>Ongoing Operations</b>												
ERP Software -- maintenance	-	0.8	0.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	16.0
Data Center	-	0.7	0.9	1.5	1.4	1.5	1.4	1.4	1.4	1.4	1.4	13.3
Support / Operations	-	-	-	2.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	28.9
ERP Upgrade	-	-	-	-	-	-	12.4	-	-	-	-	12.4
Total Cost of Ongoing Operations	-	1.5	1.7	5.3	6.2	7.3	19.6	7.2	7.2	7.2	7.2	70.6
<b>Grand Total</b>	<b>\$ 1.9</b>	<b>\$ 19.5</b>	<b>\$ 17.9</b>	<b>\$ 31.2</b>	<b>\$ 27.1</b>	<b>\$ 19.5</b>	<b>\$ 21.8</b>	<b>\$ 7.2</b>	<b>\$ 7.2</b>	<b>\$ 7.2</b>	<b>\$ 7.2</b>	<b>\$ 167.8</b>

A significant portion of the 11-year estimated amount (approximately 58%) is composed of consulting fees and ERP software costs (license and ongoing maintenance fee). The CBA estimate for these costs is a conservative estimate; it is higher than any of the estimates provided via the RFI responses (see table below).

**Consulting Fees & ERP Software**  
(\$ millions)

RFI Respondent	Consulting Fees (including upgrade in Yr. 6)	Software License	Software Maint. Fees during 10-Yr. Planning Period (adjusted)	Total Cost
AMS	\$ 43.5	\$ 14.1	\$ 17.4	\$ 75.0
Lawson	43.8	9.8	16.2	69.8
Oracle (see note)	28.8	7.3	17.4	53.5
PeopleSoft	67.7	7.7	20.4	95.8
SAP	62.2	13.5	20.2	95.9
<i>Average</i>	<i>49.2</i>	<i>10.5</i>	<i>18.3</i>	<i>78.0</i>
<i>Average (excl. Oracle)</i>	<i>54.3</i>	<i>11.3</i>	<i>18.6</i>	<i>84.1</i>
State's Estimate	\$ 71.2	\$ 10.0	\$ 16.0	\$ 97.2

**Notes:**

- Each vendor quoted a different hourly rate. The State assumed an expense-loaded, average hourly rate of \$230.
- Estimates do not include interface development or data conversion/loading (estimates not requested from respondents).
- Estimates do not include Independent Project Oversight (estimates not requested from respondents).
- Oracle did not bid on several areas.
- Adjustments were made to software maintenance fees as not all vendors quoted maintenance for all years within the planning period.

It is important to note that the estimated implementation costs presented above are very conservative (high-end) and are based on an extended five-year implementation period described above. STA believes that the ERP vendors may recommend a more compressed implementation timeline be used, which may result in significantly less implementation costs. However, the dimensions of time and cost must be balanced with the increased risk associated with a more aggressive implementation timeframe.

### ERP Benefits / Savings – System Savings

It is assumed that savings will be realized from (1) retiring existing systems as relevant portions of the ERP system become productional, and (2) avoiding costs that would likely be incurred to procure, implement, maintain, and upgrade planned/anticipated systems during the 11-year planning period (Years 0-10). An ERP system would replace many of the business systems currently in use by the State today – only highly specialized systems such as the Consolidated Retirement Information System and TRACS would likely remain. For information on the functional areas being considered in the ERP assessment, refer to the Introduction section of this report. The costs in this category are system operation and support costs, not user-related costs.

Cost information for existing and planned systems was collected for the following three systems categories:

1. The State's central administrative systems such as:
  - ◆ STARS (State of Tennessee Accounting & Reporting Systems)
  - ◆ TOPS (Tennessee On-line Purchasing System)
  - ◆ SEIS (State Employee Information System)
  - ◆ SEIS/Payroll
  - ◆ TIS (Tennessee Insurance System)
  - ◆ CRIS (Consolidated Retirement Information System) / TCRS (Tennessee Retirement Accounting Control System)
  - ◆ DC (Deferred Compensation)
  - ◆ FLEX (Flexible Benefits)

The cost of these systems is billed to agencies by Finance & Administration (F&A) according to each respective agency's use of the system.

2. Systems maintained by the agencies to enhance the functionality of the central administrative systems. The costs relating to these systems are costs incurred by agencies over and above the costs that are billed to the agencies by F&A for operating and maintaining the central administrative systems.
3. Agency-specific systems that provide functionality that is within the scope of the ERP study, but this functionality is not provided by the central administrative systems (e.g., Fleet Management, Inventory).

A survey was conducted to collect costs from agencies (including the central administrative agencies) associated with their existing and planned systems. Meetings and follow-up discussions were also conducted to collect system cost information. The compiled results of the system cost information are in Appendix G of this document.

Two assumptions were applied to the data collected via the survey that resulted in an increase in the estimated system costs:

1. The ongoing operating costs for the Department of Children's Services' (DCS) new Oracle ERP system were estimated from the cost/benefit analysis document prepared by DCS; DCS did not provide these costs via the aforementioned system survey. These costs were estimated to be approximately \$2.7 million per year.
2. Some of the largest State agencies did not respond to the system survey, and the amounts submitted by some of the large agencies that did respond to the survey appeared to be lower than what would be expected. To adjust for these two conditions, an estimated savings amount was added equivalent to 30.0 full-time equivalent (FTE) State employees (2.0 FTEs for each of the largest 15 agencies). This adjustment amounted to approximately \$2.1 million per year. While this estimate is FTE-based, the estimated amount would apply to the agencies' personnel costs (technical support and operations), as well as other system-related costs (e.g., software maintenance costs, hardware costs, etc.).

Presented in the table below is a summary of the cost of existing and planned Financial and HR/Payroll systems. Note that the Financial systems category includes the following modules: General Ledger, Accounts Payable, Accounts Receivable, Project Management, Grant Accounting, Cost Accounting / Allocation, Budget Development, Asset Management, Purchasing, Inventory, and Fleet Management.

**Cost of Existing and Planned Systems**  
(\$ millions)

	# of Systems	Year											Total
		0	1	2	3	4	5	6	7	8	9	10	
<b>Financial Systems</b>													
Current Systems	44	\$ 15.5	\$ 14.2	\$ 17.2	\$ 14.9	\$ 14.4	\$ 14.5	\$ 14.5	\$ 14.6	\$ 14.8	\$ 15.0	\$ 15.0	\$164.5
Planned Systems	6	0.9	1.2	2.8	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.5	16.9
Total	50	16.4	15.4	20.0	16.4	15.8	16.2	16.0	16.1	16.3	16.4	16.4	181.5
<b>HR/Payroll Systems</b>													
Current Systems	18	4.6	4.8	4.9	5.1	3.2	3.3	3.4	3.5	4.0	3.7	3.7	44.0
Planned Systems	5	0.3	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
Total	23	4.9	4.8	5.0	5.4	3.2	3.3	3.4	3.5	4.0	3.7	3.7	45.0
<b>Grand Total</b>	<b>73</b>	<b>\$ 21.3</b>	<b>\$ 20.2</b>	<b>\$ 25.0</b>	<b>\$ 21.8</b>	<b>\$ 19.1</b>	<b>\$ 19.5</b>	<b>\$ 19.4</b>	<b>\$ 19.6</b>	<b>\$ 20.3</b>	<b>\$ 20.2</b>	<b>\$ 20.2</b>	<b>\$226.5</b>

Note that the system costs presented in the table above would not be realized as savings until after relevant portions of the ERP system went live (i.e., after Year 2 for HR/Payroll, after mid-Year 4 for Financials, and after Year 5 for TDOT Financials). It is assumed that the existing HR/Payroll systems would be retired (and the savings would start being realized) three months after the HR/Payroll portion of ERP enters production,

and the other existing systems would be retired six months after their respective portions of ERP enter production. Furthermore, it is assumed \$300,000 would be spent prior to each group of systems being retired to cover the cost of converting historical data from the systems being retired to a data warehouse system.

## ERP Benefits / Savings – Process Improvements

The State could potentially realize process improvements in a number of areas of the organization as a result of implementing a statewide ERP system. STA has coined the term “*Value Pockets*” for what are the most likely sources of value (i.e., cost savings and other benefits) to be found in each process/functional area within the scope of a possible ERP implementation.

Dollar-quantifiable benefits were estimated from data collected from the State agencies via a *Value Pocket* survey and from data collected via interviews with central sources (e.g., Accounts). Meetings and follow-up discussions were also conducted to collect information used to estimate savings from process improvements. The compiled results of the survey are in Appendix G of this document.

Savings factors were applied to the data collected from the agencies. These savings factors were derived from a variety of sources, including the experiences of other organizations, and estimates made by STA based on STA’s analysis of the respective processes and STA’s experience, in general, in these matters.

The table below presents a summary of the estimated annual process improvement benefits/savings that could be realized from the implementation of an ERP system.

**Estimated Process Improvement Benefits / Savings**  
(\$ millions)

Functional / Process Area	Estimated Annual Savings
<b>HR/Payroll</b>	
Training	\$ 0.5
Personnel Administration	0.6
Benefits Administration	0.6
Leave Accounting	0.3
Timekeeping	2.2
Applicant Services	1.0
Payroll	0.4
Total HR/Payroll Savings	5.6
<b>Financial</b>	
GL	0.2
Budget Development	0.1
Accounts Payable	3.7
Accounts Receivable	0.3
Purchasing	0.9
Inventory	0.6
Fleet Management	0.1
Total Financial Savings	5.9
Grand Total	\$ 11.5

Not all agencies responded to the *Value Pocket* survey. For some of the large agencies that did not respond to the survey, estimates were developed based on the data submitted by agencies of similar size in terms of number of employees.

Most of the estimated *Value Pocket* savings (more than 75%) would come from the reduction in State personnel (approximately 235 FTEs). It is assumed that most of these FTE savings would be realized over time through attrition, employee retirement, reassignment to approved but unfilled positions, and the like. In keeping with this assumption, it is assumed that a certain percentage of the *Value Pocket* savings would be realized after the relevant portion of the ERP system goes live as follows:

1 <sup>st</sup> year following go-live	25%
2 <sup>nd</sup> year following go-live	50%
3 <sup>rd</sup> and remaining years following go-live	75%

## SUMMARY RESULTS

The schedule below presents a summary of estimated ERP costs applied against estimated benefits/savings.

Summary of Net Benefits/Savings from Implementing ERP  
(\$ millions)

Phases <span>➡</span>	Acquire.	HR/Payroll		Fin/Purch.	TDOT	Upgrade						Total
Cost Category	Years											
	0	1	2	3	4	5	6	7	8	9	10	
ERP Cost	\$ 1.9	\$ 19.5	\$ 17.9	\$ 31.2	\$ 27.1	\$ 19.5	\$ 21.8	\$ 7.2	\$ 7.2	\$ 7.2	\$ 7.2	\$167.8
ERP Benefits/Savings												
System Savings	1.2	1.2	2.8	5.3	4.7	19.2	19.4	19.6	20.3	20.2	20.2	134.1
Process Improvements	-	-	-	1.4	3.4	5.5	7.0	8.5	8.7	8.7	8.7	51.8
Total Savings	1.2	1.2	2.8	6.7	8.1	24.7	26.4	28.1	29.0	28.9	28.9	185.9
Net Savings (savings less ERP Cost)	\$ (0.7)	\$ (18.2)	\$ (15.0)	\$ (24.5)	\$ (19.0)	\$ 5.2	\$ 4.5	\$ 20.9	\$ 21.7	\$ 21.6	\$ 21.6	\$ 18.1
Cumulative Net Savings	(0.7)	(19.0)	(34.0)	(58.5)	(77.5)	(72.3)	(67.8)	(46.9)	(25.2)	(3.5)	18.1	

A more detailed summary schedule than the one presented above and a copy of the State's standard CBA is contained in Appendix G of this document.

No contingency/risk factors have been applied to these estimates as all the estimates are considered to be sufficiently conservative for the following reasons:

◆ ERP Costs

- The ERP implementation and maintenance cost estimates are higher than any of the estimates received from the RFI respondents (this portion of the estimate is approximately 58% of the total 11-year estimate).

- The estimated cost of ongoing operations is thought to be accurate within +/- 15%. It is assumed that the potential 15%, or so, underestimate of these costs would be more than offset by the combined underestimates of savings described in the bullet points that immediately follow.
- ♦ ERP Benefits / Savings – System Savings
  - Not all of the agencies responded to the System Survey, and it is believed that the amount of the adjustment (increase) that was made to the cost of existing systems of certain agencies to adjust for this lack of response is less than what those agencies would likely incur during the 11-year planning period of this CBA.
  - Upgrade/enhancement costs were only added to the CBA for a few of the existing systems, and the actual total upgrade/enhancement cost for all of the existing systems could be significant over the next 11 years.
  - It is assumed that the cost of new systems that would likely be implemented during the planning period in order to meet business needs not met by the current systems would most likely be sizable, and the cost of only a few of these new systems has been included in the CBA.
- ♦ ERP Benefits / Savings – Process Improvements
  - Not all of the agencies responded to the *Value Pocket* survey. While some estimates were made to adjust for the agencies that did not respond, it is assumed that process improvement savings could potentially be significantly more than the amount included in the CBA.
  - The estimated Value Pocket amounts have already been significantly discounted. As mentioned above, only 25% of the potential savings were estimated to be realized in the first year following a respective go-live, then 50% the second year, and 75% the third year and each year thereafter.

Note that breakeven/payback occurs in Year 10 (in the 11<sup>th</sup> year of the initiative taking into account Year 0) of the CBA estimate (see table above). Once payback is achieved in Year 10, the State is estimated to realize a net benefit of more than \$21 million per year from implementing an ERP system. Due to the estimated ongoing savings realized once the breakeven point is reached, the Internal Rate of Return (IRR), the discount rate at which the Net Present Value (NPV) is equal to zero, for the project increases steadily thereafter (see table below).

Year	IRR
10	3.8%
11	7.0%
12	9.3%

## EVALUATION OF ALTERNATIVE SCENARIOS

Analyses were also conducted to evaluate two alternative scenarios (i.e., scenarios that are variations of the base-case scenario presented above):

- ◆ Scenario 1: Implementing HR/Payroll Only
- ◆ Scenario 2: Excluding TDOT's Financial systems and the system that provides the primary support for Benefits Administration (i.e., TIS)

### Scenario 1: Implementing HR/Payroll Only

The table below presents a summary of the net benefits/savings from only implementing the HR/Payroll functionality of an ERP system. More detailed schedules supporting our analysis are included in Appendix G of this report.

Summary of Net Benefits/Savings from Implementing ERP  
Scenario 1: HR/Payroll Only  
(\$ millions)

Phases →	Acquire	HR/Payroll		Fin/Purch.	TDOT	Upgrade						Sub-total					Total
Cost Category	Years												11	12	13	14	
	0	1	2	3	4	5	6	7	8	9	10						
ERP Cost	\$ 1.6	\$ 19.5	\$ 16.7	\$ 6.2	\$ 3.9	\$ 3.9	\$ 8.4	\$ 3.5	\$ 3.5	\$ 3.5	\$ 3.5	\$ 74.1	\$ 3.5	\$ 3.5	\$ 3.5	\$ 3.5	\$88.0
ERP Benefits/Savings																	
System Savings	0.3	0.0	0.0	3.8	3.2	3.3	3.4	3.5	4.0	3.7	3.7	29.1	3.7	3.7	3.7	3.7	44.1
Process Improvements	-	-	-	1.4	2.8	4.2	4.2	4.2	4.2	4.2	4.2	29.2	4.2	4.2	4.2	4.2	45.9
Total Savings	0.3	0.0	0.0	5.2	6.0	7.5	7.6	7.7	8.2	7.9	7.9	58.3	7.9	7.9	7.9	7.9	90.0
Net Savings (savings less ERP Cost)	\$ (1.3)	\$ (19.4)	\$ (16.7)	\$ (1.0)	\$ 2.1	\$ 3.7	\$ (0.8)	\$ 4.2	\$ 4.7	\$ 4.4	\$ 4.4	\$ (15.7)	\$ 4.4	\$ 4.4	\$ 4.4	\$ 4.4	\$ 1.9
Cumulative Net Savings	(1.3)	(20.7)	(37.4)	(38.4)	(36.3)	(32.6)	(33.5)	(29.3)	(24.6)	(20.1)	(15.7)		(11.3)	(6.9)	(2.5)	1.9	

Under this scenario, the project would breakeven in Year 14 of the project (in the 15<sup>th</sup> year of the initiative taking into account Year 0) and would provide approximately \$4.4 million per year in net savings to the State each year thereafter. The estimated Internal Rate of Return (IRR) for Scenario 1 is presented in the table below.

Year	IRR
10	-8.0%
11	-5.0%
12	-2.7%
13	-0.9%
14	0.6%

It should be noted that the estimate for Scenario 1 (as well as all other estimates in this CBA) does not include any savings of costs that would be incurred in the future to significantly upgrade/enhance the existing HR/Payroll systems or implement a new HR/Payroll system(s) for the State. The inclusion of these savings would shorten the breakeven period and increase the IRR.

## Scenario 2: Excluding TDOT's Financial Systems and Benefits Administration

The table below presents a summary of the net benefits/savings from implementing ERP but excluding TDOT's financial systems and not replacing TIS, the primary system that supports Benefits Administration. More detailed schedules supporting our analysis are included in Appendix G of this report.

Summary of Net Benefits/Savings from Implementing ERP  
Scenario 2: Not Replacing TDOT's Financials & Not Replacing TIS  
(\$ millions)

Phases <span>→</span>	Acquire.	HR/Payroll	Fin/Purch.	TDOT	Upgrade							Sub-total	11	Total
Cost Category	Years													
	0	1	2	3	4	5	6	7	8	9	10			
ERP Cost	\$ 1.9	\$ 20.2	\$ 18.6	\$ 29.9	\$ 20.9	\$ 7.1	\$ 16.6	\$ 7.0	\$ 7.0	\$ 7.0	\$ 7.0	\$ 143.3	\$ 7.0	\$150.4
ERP Benefits/Savings														
System Savings	1.2	1.2	2.8	3.1	3.7	13.3	13.1	13.3	13.9	13.8	13.8	93.2	13.8	106.9
Process Improvements	-	-	-	1.3	3.2	5.1	6.4	7.7	7.7	7.7	7.7	46.5	7.7	54.2
Total Savings	1.2	1.2	2.8	4.3	6.9	18.4	19.5	21.0	21.6	21.4	21.4	139.7	21.4	161.1
Net Savings (savings less ERP Cost)	\$ (0.7)	\$(19.0)	\$(15.8)	\$(25.5)	\$(14.0)	\$11.3	\$ 2.9	\$13.9	\$ 14.5	\$14.4	\$14.4	\$ (3.6)	\$14.4	\$ 10.8
Cumulative Net Savings	(0.7)	(19.7)	(35.5)	(61.0)	(75.0)	(63.8)	(60.8)	(46.9)	(32.4)	(18.0)	(3.6)		10.8	

As the schedule above indicates, under Scenario 2, the project is estimated to breakeven in Year 11 of the project (in the 12<sup>th</sup> year of the initiative taking into account Year 0) and would provide more than \$14 million per year in net savings to the State every year thereafter. The Internal Rate of Return (IRR) for this scenario is presented below.

Year	IRR
10	-0.9%
11	2.3%
12	4.6%
13	6.4%

## ADDITIONAL INTANGIBLE BENEFITS

The implementation of an ERP system will provide numerous additional intangible benefits whose value is not quantifiable, is unknown, and/or cannot be validated. These are benefits/savings other than those that have been quantified and presented in the previous sections of this CBA. It is anticipated that an ERP system will provide the following intangible benefits:

### Enterprise-Wide

- ♦ Reduction in staffing costs in a number of functional/process areas due to the standardization of business processes and supporting technology across agencies (i.e., more efficient processes, support effort reduced to supporting a single system, better use of workforce by facilitating transfer of employees to other agencies).

- ◆ Reduction in technical staffing needs/costs over time by making more efficient and accurate research capabilities available to the end user through enhanced ad hoc reporting and inquiry functionality.
- ◆ Improved data integrity and reduction in staffing costs due to elimination of reconciling tasks associated with maintaining duplicate data in multiple databases.
- ◆ Reduction in staffing costs due to elimination of duplicate data entry and related errors as pertinent data is entered once in the ERP system and then carried throughout the system and updates other modules where appropriate.
- ◆ Reduction in staffing costs over time due to more efficient processing of electronic documents/transactions in a “paperless” environment. Additional reduction in paper (e.g., hard-copy purchase order, personnel action form) and handling costs. Reduction in physical storage needs and costs.
- ◆ Reduction in staffing costs over time due to more efficient processing and control of documents through enterprise-wide use of workflow management in a number of areas in the organization, which provides for electronic document routing, review and approval, provides for inquiries on document status, and a more efficient document filing and retrieval process.
- ◆ Reduction in staff training costs over time through the use of a graphical user interface that provides an easy-to-use, intuitive interface and user-friendly features such as pull-down menus, point and click operation, pop-up windows, scroll bars, radio buttons, and on-line help to assist in the user’s learning and ongoing use of the system.

### Applicant Services

- ◆ Better utilization of the State’s workforce through enhanced search capabilities for matching current state employees with the skill set requirements for open positions in state government.

### Benefits Administration

- ◆ Reduction in staffing required to process changes to benefits during open enrollment as much of the process can be completed by employees by utilizing self-service functionality through a web browser or kiosk. Also reduces time to establish benefits for new hires, make dependent changes, etc.

### Payroll

- ◆ Reduction in costs associated with processing hard-copy payroll remittance advices and staffing required to research questions about payroll withholding as employees can access detailed remittance advice information by utilizing self-service functionality through a web browser or kiosk.

### Time Reporting and Leave Accounting

- ◆ Reduction in staffing costs associated with processing employee leave balance reports as employees can view their leave balances and request time off by utilizing self-service functionality through a web browser or kiosk.

### Training and Career Development

- ◆ Reduction in staffing costs associated with processing training registrations as employees can register for available training classes by utilizing self-service functionality through a web browser or kiosk.
- ◆ Reduction in the cost of providing training classes through improved scheduling

### Accounts Receivable

- ◆ More efficient collection of receivables owed the State due to:
  - Customer service improvements associated with standardized billings;
  - Automatic generation of customer statements with invoice and interest detail;
  - Automatic generation of dunning notices;
  - Access to dunning history for each customer; and
  - Timelier update of financial information in the General Ledger.

### Accounts Payable

- ◆ Reduction in paper processing and accounts payable cycle time.
- ◆ Reduction in staffing costs associated with processing employee travel and expense reimbursements as employees can complete these reports by utilizing self-service functionality through a web browser or kiosk, and obtain proper approvals through pre-defined workflow capabilities. Employees can also check the status of the travel and expense reimbursements by utilizing vendor payment status inquiry functionality through a web browser or kiosk, thus allowing for the redirection of accounts payable staff devoted to answering these inquiries to more value-added tasks.
- ◆ Reduction in cycle time and in errors associated with paper mailings by transitioning payments to EFT.

### General Ledger

- ◆ Reduction in systems development and maintenance costs as a truly flexible chart of accounts will allow the State to meet its current and future statewide and agency-specific financial reporting and accounting needs without having to extensively modify existing legacy systems and/or fund future user agency administrative systems projects.
- ◆ Improvement in the cycle time required to close the books at month-end and year-end (FTE savings estimated in Value Pocket analysis for year-end close).

### Project and Grant Accounting

- ◆ Increased cash flow as a result of automatic grant drawdowns.
- ◆ Timely processing of grant billings.

### Budget Development

- ◆ Reduced cycle time for developing the State's budget.
  - Standardized budget development process will facilitate the redirection of budget development staff from “assembling” the budget to more value-added analytical tasks.
- ◆ “What if?” analytical tools allow budget analysts and department managers to make better decisions.

### Asset Management

- ◆ Cost savings via more accurate depreciation accounting.
- ◆ Greater compliance with GASB 34 infrastructure reporting requirements.

### Procurement / eProcurement

- ◆ Reduction in staffing costs associated with the registration of vendors to do business with the State by utilizing vendor registration self-service functionality through a web browser.
- ◆ Increased vendor access to bid opportunities through the use of “push” technology to notify vendors of bid opportunities (based on the commodities they are registered to provide) through industry-standard email applications.
- ◆ Reduced prices paid for goods and services through increased competition for the State's business as a result of a more dynamic pricing model (e.g., vendor catalogs that can be accessed by the public, reverse auctions).
- ◆ Significant savings in the overall cost of goods and services purchased through the adoption of Strategic Sourcing (some organizations have saved millions of dollars). These savings come primarily from organizations better leverage their purchasing power by combining contracts/purchases across the organization.
- ◆ Reduced paper printing and mailing costs due to the “paperless” environment.
- ◆ Improved purchasing policy compliance because rules are automated.
- ◆ Ability to utilize standard RFx templates increases compliance with state procurement policies.
- ◆ Single consolidated vendor file reduces duplicate data entry and provides for consistent entry of vendor information.

- ◆ Reverse auctions, in which requirements are placed on a designated State web site and bids/re-bids are received from suppliers until the auction is closed, increases procurement options while dramatically reducing the cost of bidding on goods and services.
- ◆ Improved vendor performance via tracking of historical performance.
- ◆ Savings from reducing “maverick” buying.

## IMPLEMENTATION RISKS AND LESSONS LEARNED

Based on STA's prior experiences in providing ERP related services to governmental entities, results of surveying other states that have implemented ERP systems, and additional marketplace research, we offer the following as major risks that can materially impact and sometimes lead to failure of ERP projects and lessons learned that will help mitigate those risks. These risks and lessons have been grouped as follows:

- ◆ Project Management
- ◆ Personnel
- ◆ Change Management/Organization Alignment
- ◆ Software Implementation
- ◆ Software and Services Acquisition

Detailed information obtained from the surveys of other states is included in Appendix D.

The major risks and lessons learned are documented as follows:

### PROJECT MANAGEMENT

- ◆ **Project “Scope Creep”** – Project scope must be well defined and tightly controlled to mitigate “scope creep”. A recommended method to control “scope creep” is to utilize a detailed project workplan and budget and implement a structured scope control process that is rigorously followed.
- ◆ **Inadequate Project Control** – Projects often fail due to inadequate and ineffective project management. Utilization of a formal project management methodology and an experienced project manager (in-house or contractor) is required for a successful ERP implementation. Additionally, structured processes should be implemented to ensure that all issues and project risks are properly logged in, assigned, tracked, and managed.

### PERSONNEL

- ◆ **Part-Time Resources** – Projects are understaffed when not enough resources are assigned and/or resources are committed on a part-time basis to the project because these resources are forced to choose between competing job duties. An adequate number of the right State resources should be committed to the project on a full-time basis, and key positions should be back-filled as necessary to ensure the project team has access to the proper subject matter experts.
- ◆ **Inadequate Knowledge Transfer** – ERP projects frequently experience inadequate knowledge transfer and a continued reliance on consultants to provide ongoing support for the system. It is not uncommon for consulting resources to continue providing post-implementation support to a government for several years after “go live”. The software is too complex and the business changes too dramatic to trust

the project to anyone other than the best and brightest State resources. Contracts for ERP implementations typically require that the State commit specific levels and types of resources to the project. These State resources must be available when needed, and must have the types of skills required for the role they have been placed in.

- ◆ **Project Staffing and Retention** – Project team turnover can also pose a problem. Care should be taken to recruit the best and brightest resources to the project team, and a plan should be developed to provide incentives for keeping staff; otherwise, consulting firms and other companies will “scoop them up” once they have acquired ERP training and experience.
- ◆ **Unqualified Implementation Consultants** – The implementation can be delayed, fail, or seemingly never end due to incorrect actions/decisions by the implementation consultant. The implementation consulting team must have thorough knowledge of the ERP software to be implemented and/or knowledge of how public sector entities operate.

#### **CHANGE MANAGEMENT/ORGANIZATION ALIGNMENT**

- ◆ **Unrealistic Expectations** – End users and management are often times disappointed in the capabilities of the implemented ERP system. Some public sector ERP projects have failed to deliver system capabilities on which the business case justification and return on investment were established. It is not uncommon to find governmental ERP installations that have not implemented workflow and budget development functionality, and are using the ad hoc reporting tools that are provided as part of the ERP software suite as extensively as originally envisioned. Project management must manage expectations of the State’s leadership, the project sponsors, the project team, and the end users. It is important that realistic expectations be clearly and frequently communicated throughout the organization.
- ◆ **Insufficient Change Management** – It is common for organizations to underestimate the level of change management required as part of an ERP implementation. Most projects that fail do so because the human aspects of the project fall short – not because the system does not work as designed. The new system will drive the implementation of new business processes that may radically change the work environment and job tasks of employees. The risks associated with not recognizing and properly managing organizational change impacts can disrupt the project implementation effort and system acceptance, decrease employee productivity, and increase employee stress and anxiety.
- ◆ **Conflicting Objectives** – Turf battles over system ownership and software functionality may arise. Legacy systems were often developed to meet the business needs of specific agencies, while the entire government, as an enterprise, owns a properly implemented ERP system. Conflicting objectives can greatly impact the success of a project. It is critical that key executives and elected officials are correctly aligned and are “pulling together” to support the project. ERP systems require government agencies to fully cooperate with each other in order to operate efficiently.

- ◆ **Inadequate Decision-Making Authority** – The project team must not only have the skills to make good decisions regarding the State’s business processes, they must also be empowered with the appropriate authority to resolve issues and make decisions in a timely manner. In the case where the issue is beyond the authority for the project team to resolve, the steering committee must be prepared to make decisions quickly so that the project is not delayed.
- ◆ **Insufficient End User Training** – Training of end users is absolutely critical to success when implementing an ERP system. Care must be taken to properly staff the training function, especially if a “train-the-trainer” approach is to be used.
- ◆ **Lack of Executive Support** – A perceived or real lack of executive support for the project almost certainly will ensure its failure; strong executive management support and commitment across state government are a must. Widespread communication of executive support is essential to obtaining buy-in from all levels of the organization, especially since ERP systems generate so much change across the enterprise.

## SOFTWARE IMPLEMENTATION

- ◆ **Extensive Modifications** – Extensive modifications to the ERP software increase project risk, lead to project cost and time overruns, and often impair the installation of future product releases. In early ERP projects implemented for governments, a heavy emphasis was placed on modifying the software to better meet the government’s system needs. ERP functionality for the public sector has matured in recent years and governments have begun to embrace process change by adopting the best practices found in today’s ERP systems, resulting in a significant decrease in the amount of customization to the underlying software code.
- ◆ **Unreasonable Timelines** – Unrealistic implementation timeframes and deployment strategies have led to cost overruns and scaled-back functionality. These days, ERP vendors are touting accelerated implementation methodologies to reduce implementation costs. However, the timelines associated with an accelerated approach may be unrealistic given the degree of change that must be absorbed across the entire government enterprise.
- ◆ **Inadequate Planning for Data Conversion and Software Testing** – The government is typically tasked with converting data from the legacy systems. The more data that is converted from the legacy system, the greater the risk to the ERP project. Care must be taken to ensure that adequate time and appropriate personnel are available to successfully complete the task.
- ◆ **Unprepared for Ongoing Operations** – Some governments have not adequately prepared to administer and run the ERP system after implementation. Care should be taken to ensure that the organization has the capability to adequately maintain the system and provide end user support.

- ◆ **Unprepared for Software Technology Change** – The software, tools and databases formerly used in legacy software are not readily transferable to modern ERP systems. Extensive training and retooling of IT staff is required to ensure successful ERP implementation and ongoing maintenance.

## **SOFTWARE AND SERVICES ACQUISITION**

- ◆ **Insufficient Contract Accountability** – At times, during prior government ERP implementation projects, the governments have not been able to hold the prime contractor accountable for project results. These problems can be mitigated by drafting a well-crafted procurement instrument and contract with the vendor that is results-based, and ties vendor payments to deliverables and project milestones.
- ◆ **Vendor Protests** – Software or implementation service acquisition can result in contested awards or dissatisfaction with the implementation contractor selected. Care should be taken to develop and utilize a formal proposal evaluation methodology to evaluate all proposals received for ERP software and implementation services. In order to decrease the likelihood of a vendor protest and increase the likelihood of obtaining a qualified implementation partner, organizations have obtained external help with the proposal evaluation process and with contract negotiations if such expertise is not available in-house.
- ◆ **Unmet Business Needs** – The ERP software, as configured, may not meet the State's business needs and/or may include components of "vaporware".

A major concern exists regarding ERP systems' ability to meet the State's civil service hiring requirements. At the time of this report, it appears that most states that have implemented ERP systems have been unable to address their civil service functional needs with "out of the box" ERP functionality, and have instead continued to utilize "stand-alone" systems to address their civil service hiring requirements. Selecting and implementing an ERP system that does not meet the State's civil service requirements could result in (1) making considerable customizations to the baseline ERP software, (2) continuing to maintain and interface with the State's current systems that support these requirements, and/or (3) incurring legal exposure associated with a failure to comply with State law.

To mitigate this problem, the State must start by including a comprehensive set of system requirements in the RFP, and require that vendor responses to meeting the requirements be made a part of the contract between the State and the vendor. Vendors should be required to demonstrate specified system requirements in accordance with a structured demonstration script developed by the State's evaluation committee. A formal process should then be established and followed to monitor that all system requirements are being met during system design and configuration.

## ALTERNATIVES TO ERP

The maturity of public sector functionality commonly found in Enterprise Resource Planning software and the emergence of eProcurement and Constituent Relationship Management (CRM) software are driving governments to look at replacing their existing administrative systems. However, major budgetary constraints are causing elected officials and government administrators to closely scrutinize this decision and consider possible alternatives to implementing an ERP system.

### **WHAT ARE THE MOST VIABLE ALTERNATIVES TO ERP?**

Based on work performed to date as part of the ERP Automation Assessment Study, the following alternative solutions are provided for consideration by the ERP Work Group and the State's leadership:

1. Status Quo
2. Custom Development
3. Implement a "Best-of-Breed" Solution to Address Immediate Needs
4. Enhance Existing Systems and Processes
5. Hosted Payroll and/or Human Resources Processing

These alternative solutions are presented for discussion purposes only and none are recommended for implementation at this time.

### **Status Quo**

#### **Description of Solution**

The "Status Quo" alternative is presented as a baseline for comparison with other solutions. This solution provides for keeping the existing statewide legacy systems in place, while making no enhancements in functionality to the current systems or new integration among these systems.

The State's current administrative business processes are conducted through the use of numerous legacy applications as well as user agency applications that are used to meet specific agency needs (e.g., grant, project, and cost accounting needs, fleet management). Integration is limited, but there is a fair amount of interfacing between the statewide administrative systems. The existing administrative systems environment is documented in Appendix E: Interface Model.

#### **Pros**

- ◆ No disruption of current business processes.

- ◆ Limits inherent risks associated with changing current systems (assumes ongoing maintenance will still occur where applicable).
- ◆ No additional costs beyond normal maintenance.

### **Cons**

Fails to address the following problems:

- ◆ Current administrative systems require considerable technical resources and time to modify.
- ◆ Continued reliance on paper documents and the inefficient workflow associated with processing them.
- ◆ Lack of real-time integration within and among statewide financial, procurement, and human resources/payroll systems and symptoms thereof.
- ◆ Fails to take advantage of best business practices inherent in ERP systems.
- ◆ Time-consuming reconciling tasks associated with maintaining duplicate data in multiple databases.
- ◆ Facilitates user agency's continuance to fund new systems projects in order to meet agency administrative business needs not being met by existing statewide systems.
- ◆ Lack of adequate ad hoc reporting capabilities.

### **Constraints and Risks**

The risk associated with the "Status Quo" solution is that it provides no additional functionality or technological improvements; therefore, current systems may not meet the State's future needs. Specifically, the existing systems lack real-time integration with one another, and do not include an adequate end user reporting facility. Additionally, the State's legacy financial, procurement, and human resources/payroll systems and associated support are not positioned to respond rapidly to changes in business processes or technology.

This option includes a major risk of technical obsolescence. While the State has followed industry standards in maintaining and enhancing its existing systems, these standards are being applied to a group of systems lacking integration, a common database, data consistency, and extensive management reporting capabilities.

### **Feasibility of Solution**

As stated above, this solution ensures that current financial, procurement, human resources/payroll, and other administrative systems will remain operational in the near term; however, it places the States strategic direction on hold indefinitely. It is not considered a viable solution for addressing future administrative systems needs.

## **Custom Development**

### **Description of Solution**

The “Custom Development” (Custom) option will provide for the in-house development of a new fully integrated client/server, web-centric application that will meet the State’s functional and technical system requirements. System programs would be developed using fourth-generation or higher programming languages, development tools, and development environment. All data would be maintained in a single, uniform, database. By adapting to an open client/server system architecture, modern tools and design techniques would assist the State in achieving a flexible, interoperable, and modular system, which can meet the future needs of the State.

### **Pros**

- ◆ Assumed to meet 100% of the State’s functional requirements.
- ◆ System will be designed to provide full integration among the core areas of functionality.
- ◆ Will be built in compliance with the State’s strategic technology direction.

### **Cons**

- ◆ Will take a minimum of three to four years to design, develop, properly test, and deploy.
- ◆ Requires extensive training of existing personnel and/or outside support assistance in the latest system development tools and methodologies.
- ◆ The State would solely fund all initial development costs and risks, as well as future ongoing software upgrade / maintenance costs.

### **Constraints and Risks**

Based on our experience with custom solutions, we believe that the extremely high risk of project failure associated with the Custom option renders this option unacceptable to the State due to its size, complexity, project duration, and funding requirements. Only organizations with considerable funding can support the high cost of ownership and complexity associated with developing and maintaining custom-developed applications.

### **Feasibility of Solution**

Due to the numerous risks associated with a project of this magnitude and the ongoing costs associated with maintaining and enhancing the system for future use, custom development of a new fully integrated system is not considered a feasible alternative and will be given no further consideration.

## **Implement a “Best-of-Breed” Solution to Address Immediate Needs**

### **Description of Solution**

Increasingly, organizations are looking at commercially available software solutions’ ability to meet specific business requirements as the primary driver in determining the best solution. The “Best-of-Breed” option means that the State would choose the best product available for each business function and build and maintain the necessary integration. Specifically, the State could focus its efforts on acquiring software and implementation services to address its

most compelling needs at this time – human resources and payroll administration, and implement other “best-of-breed” solutions to address financial, procurement, and other administrative systems needs as the need arises and funding is made available. It is highly likely that a “best-of-breed” solution will be utilized to meet the State’s fleet management requirements anyway as ERP solutions typically do not provide for a sophisticated solution to meet these needs.

### **Pros**

- ◆ Ability to meet a high percentage of the State’s business requirements in specific functional areas; potentially greater depth of functionality in these areas.
- ◆ Take less time to implement or upgrade.
- ◆ Typically costs considerably less, initially, than ERP software solutions, though ERP software is often implemented using a “best-of-breed” approach (e.g., PeopleSoft’s human resources software with SAP’s financial management software).
- ◆ Provide many of the same features commonly found in ERP systems (e.g., automated workflow, ad hoc reporting tools, self-service functionality).

### **Cons**

- ◆ Requires the State to maintain resources skilled in multiple development toolsets and programming languages.
- ◆ Lacks “true” integration of ERP systems, though some “best-of-breed” vendors now provide for integration points with common ERP systems that allow for “real-time” integration.
- ◆ Higher total cost of ownership than ERP over time because of the cost of integration, supporting multiple development environments, and managing multiple vendor relationships.
- ◆ Time-consuming reconciling tasks associated with maintaining duplicate data in multiple databases.

### **Constraints and Risks**

Care should be taken in planning for the acquisition of “best-of-breed” software to ensure a proper “breaking of the integration” – by this we mean that there are best practices for combining “best-of-breed” software applications to meet an organization’s administrative business needs. A common and relatively low-risk option is to buy acquire one vendors human resources and payroll software suite, and interface it with another vendors financial management and procurement software suite.

### **Feasibility of Solution**

“Best-of-Breed” solutions are viable alternatives for meeting the State’s administrative business needs as long as care is taken to select a high quality solution that is supported by a stable company. These solutions are especially attractive during difficult economic times when funding is limited.

## Enhance Existing Systems and Processes

### **Description of Solution**

This alternative would provide for enhancements to the existing statewide legacy systems. Potential enhancements include:

- ◆ Development of a data warehouse and ad hoc reporting tools to allow end users to create many of their own reports;
- ◆ Modification of the existing systems and/or acquisition of third party “add-on” software to enhance functionality and/or address process improvement opportunities; and
- ◆ Improved user interface for selected applications.

This option has the potential to produce a greatly improved reporting capability, but will provide only a marginal increase in productivity due to limited opportunities to improve integration and system functionality, and the lack of use of best business practices and automated workflow capabilities.

### **Pros**

- ◆ Does not disrupt normal business operations as much as a system replacement project.
- ◆ Does not require the replacement of application software.
- ◆ Not necessary to train users on an entirely new system, only certain features.
- ◆ Leverages the skills of existing IT personnel.
- ◆ Costs would be considerably less than with a replacement solution.

### **Cons**

- ◆ High risk associated with modifying the existing legacy systems.
- ◆ Fails to provide the efficiencies and process improvements that other options will provide.
- ◆ Considered only a “stop gap” option.

### **Constraints and Risks**

Any potential modifications to the human resources will include high risk due to the fact that the system has been modified numerous times in the past, and the State has limited IT resources that are technically proficient with this system. Customization of any of the administrative systems includes inherent risks.

### **Feasibility of Solution**

This option is considered feasible only as a “stop gap” until other more viable options can be implemented.

## Hosted Payroll and/or Human Resources Processing

### *Description of Solution*

Hosting means contracting with independent suppliers to meet an organization's in-house needs. Numerous hosting models exist today, but the most common model involves the client paying a subscription fee for use of specified software that is maintained by the application service provider (ASP). The ASP provides the technical infrastructure and support services to the client organization.

One option available to the State is to outsource its payroll processing function. Automatic Data Processing, Inc. (ADP) processes payrolls for 450,000 employers worldwide, including 30 million workers. They offer similar services for human resources services; however, it is unknown whether a hosted solution could meet the State's human resources business needs.

### *Pros*

- ◆ Expected cost savings (brief history has shown varied actual results).
- ◆ Reduced need to hire and retain highly skilled (and expensive) technical resources.
- ◆ Very high levels of “uptime” and maintenance that is seamless to the user.
- ◆ Improved levels of customer service (brief history has shown varied actual results).
- ◆ Reduced need to purchase new, rapidly depreciating hardware and software.
- ◆ Reduced initial investment and “pay-as-you-go” financing.
- ◆ Predictability of cash flow.
- ◆ Decreased cost of ownership.
- ◆ Operating expense versus capital expense.

### *Cons*

- ◆ Negotiations typically involve multi-year “lock-in” contracts, which raise concerns of vendor stability (GartnerGroup analysts estimate that 60% of the ASPs in business today will fail in the near future) and quality of service.
- ◆ On multi-year contracts, vendor profits are often “backend loaded” into the later years of the contract, so that attractive first year pricing may be misleading.
- ◆ As needs and business grow, organizations see their use of computer services increase over the years, and vendor billings increase accordingly; however, additional work typically is priced higher than the initial services, so that anticipated cost savings may not materialize.
- ◆ Political risk (State jobs may go away).
- ◆ Offer limited flexibility – these solutions work well in a standardized environment but tend to break down when an entity has unique needs.

### ***Constraints and Risks***

The potential for contract disagreement over what activities and services are included in the price is very high, particularly in later years when vendors expect their profits to increase.

Where hosting has failed to be cost-effective or does not yield satisfactory service delivery, the organizations involved have struggled to reinstate in-house functions without impacting services.

### ***Feasibility of Solution***

Hosting is a viable alternative if the delivery of service can be measurably improved and/or costs controlled or reduced significantly without unacceptable levels of risk and side effects. At the present time, payroll processing appears to be the viable candidate for hosting.